

City of Lincoln 2015 Urban Water Management Plan

**Public Review Draft
June 2016**

Prepared by:



[PLACEHOLDER PAGE FOR FLY SHEET AND ENGINEER'S STAMP]

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CHAPTER 1. INTRODUCTION

The City of Lincoln (City) has prepared this Urban Water Management Plan (UWMP) to satisfy the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers. The City carries out a broad range of metropolitan responsibilities, including retail supply of treated water and is therefore subject to the UWMPA requirements. The City currently serves about 10,000 acre-feet per year (af/yr) of water to a population of over 45,000 through approximately 15,000 residential connections and hundreds of non-residential connections.

This UWMP addresses the current and future state of the City's water supplies and demands and assesses the availability of supplies to meet future demands during normal, single-dry and multiple dry years. Verification that future demands will not exceed supplies and the security of supplies in dry year conditions is an important aspect of this UWMP.

The City receives surface water from the Placer County Water Agency (PCWA) and Nevada Irrigation District (NID). These water supplies are treated and delivered to the City by PCWA. PCWA and NID also deliver raw water directly to raw water customers in and around the City, but these demands are assessed in PCWA's and NID's UWMPs since they are the water suppliers.

In addition to the City's primary surface water supply, the City owns and operates five groundwater wells. These groundwater wells supply about 10 percent of the annual demand during normal years. These wells, however, are able to supply more than 30 percent of the City's demand during daily shortages related to seasonal peaks and emergency outages. The City also operates a wastewater treatment facility. Water supplies derived from this facility may be used in areas consistent with the State's regulatory permitting process.

The City has maintained a proactive infrastructure maintenance and replacement strategy over the years, with heightened efforts during the last few years of the ongoing drought.

Note To DWR

The City of Lincoln has written this UWMP primarily as a water resources planning tool and secondarily to satisfy the requirements of the UWMPA.

The body of the document provides narratives and discusses data that DWR requests in its 2015 UWMP Guidebook, including changes to the California Water Code since 2010.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into DWR Tables consistent with the organization of the tables in Section E of the 2015 UWMP Guidebook Appendices. These tables are in **Appendix A-1**.

Also, this UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Section F of the 2015 UWMP Guidebook. A completed checklist is included in **Appendix A-2**.

Metering has helped with water use reductions, providing customers with greater water-use awareness and response to demand management efforts. Water use has been trending down since the 12,500 af/yr peak in 2006, with 2015 water use at about 7,600 af/yr under curtailment and mandatory conservation.

The City's 2015 Urban Water Management Plan documents its water management planning efforts to ensure adequate water supply to meet demands over the next 25 years.¹ The UWMP specifically assesses the availability of supplies to meet future demands during normal, single-dry and multiple dry years. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry year conditions are critical outcomes of this UWMP.

The 2015 UWMP is an update to the City's 2010 UWMP and presents new data and analysis as required by DWR and the California Water Code (CWC) since 2010. The 2015 UWMP is also a comprehensive water planning document which describes existing and future supply reliability, presents demand management progress, and identifies local and regional cooperative efforts to meet the City's long-term water needs.

The current four-year drought has emphasized the importance of meeting water dry-year water demands, and the 2015 UWMP also addresses the evolving impact of drought on City's water supply and operations.

1.1 Urban Water Management Planning Act

The UWMPA requires every urban water supplier to prepare an urban water management plan pursuant to California Water Code (CWC) § 10610 et seq.² As stated previously, the City currently serves about 10,000 af/yr of treated water through numerous residential and non-residential connections – serving a population of over 45,000. Because the City's water service exceeds the threshold for preparation of an UWMP, the City has prepared its 2015 UWMP in compliance with the UWMPA. The 2015 UWMP provides a framework for water planning to minimize the negative effects of potential water shortages, and provides useful information to the public about the City and its water management programs.

Specifically, the 2015 UWMP describes and evaluates the quality and reliability of the City's existing and planned water supplies. This includes availability and sufficiency of

¹ The City uses a 25 year planning horizon rather than the 20 year planning horizon prescribed in the Water Code in order to preserve the utility of the City's plan throughout the time period leading up to the next UWMP update.

² An "urban water supplier" is a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually." CWC § 10617.

groundwater³, vulnerability of supply to seasonal and climactic conditions, and opportunities for exchanges or transfers on a short-term or long-term basis.

The UWMP also presents baseline per-capita water use data and target conservation values as required by CWC §10608 et seq. This includes narratives describing its water demand management measures,⁴ its long-term plan for efficient water use, as well as estimated future water savings based on water use projections, where available. Distribution system water loss and information on potential use of recycled water as a water source for the City are included in the UWMP's comprehensive conservation analysis.

Also included in the UWMP is a comprehensive water shortage contingency analysis, as required by the UWMPA, which details stages of action to be undertaken by the City in response to water supply shortages.⁵

1.2 Public Participation and Agency Coordination

The UWMPA requires a water purveyor to coordinate the preparation of its UWMP with other appropriate agencies and organizations in and around its service area. This includes coordination with other water suppliers that share a common source, water management agencies, and relevant public agencies. The City has prepared this UWMP in coordination with water utilities that provide water for the City. Additionally, the City encouraged active involvement of other diverse sectors of the population prior to and during the preparation of the plan. The City has also coordinated the preparation of this plan with other appropriate local government agencies, as listed in **Table 1-1**. Copies of the notification letters sent are included in **Appendix B-3**.

³ A copy of the City's current groundwater management plan via the Western Placer County Groundwater Partnership can be found at:

https://www.pcwa.net/files/docs/enviro/WPCGMP_Groundwater_Management_Plan_07.pdf

⁴ As detailed in the CWC § 10631 (f)(1) and (2)

⁵ A recent amendment to CWC § 10632 includes defining water features that are artificially supplied with water as part of this contingency analysis.

Table 1-1 – Public and Agency Coordination⁶

Coordinating Agencies	Coordinate regarding Demands	Sent Copy of Draft UWMP	Sent 60-Day Notice	Notice of Public Hearing
Cities, Counties, Retail Customers and Interested Parties				
Placer County			√	√
Placer County Water Agency	√	√	√	√
Nevada Irrigation District	√	√	√	√
Sacramento Area Council of Govts			√	√
General Public				√
<i>Shared Groundwater Resource Interests</i>				
South Sutter Water District			√	√
City of Roseville			√	√
California American Water District			√	√

1.2.1 Regional Water Authority

The City of Lincoln is a member of the Regional Water Authority (RWA). RWA is a joint powers authority that serves and represents the interests of 26 water providers in the greater Sacramento, Placer, El Dorado and Yolo County regions. Two other RWA members from Placer County are PCWA and the City of Roseville. Both of those members are also members of the Western Placer County Groundwater Plan partnership described below.

RWA's primary mission is to help its members protect and enhance the reliability, availability, affordability and quality of water resources. RWA has launched significant programs and services on a regional scale, including: (1) A water efficiency program designed to help local purveyors implement best management practices on a regional basis; (2) implementation of the American River Basin Regional Conjunctive Use Program to build and upgrade water facilities throughout the region to better manage surface and groundwater resources; and (3) development of an Integrated Regional Water Management Planning Program to continually identify the regional projects and partnerships that will help the region best meet its future water needs. RWA has provided grant moneys to the City for various water related improvements including development of its wastewater treatment plant, the installation and repair of two groundwater wells, and the installation of a reclamation piping system.

1.2.2 Western Placer County Groundwater Management Plan Partnership

The WPCGMP partnership is designed to assist the City of Lincoln, City of Roseville, Placer County Water Agency (PCWA), and the California American Water Company (CAW) in an effort to maintain a safe, sustainable and high-quality groundwater resource

⁶ Note: The UWMP draft was made available on www.lincolncwa.gov

within a zone of the North American Groundwater Subbasin. The WPCGMP has as its objective the maintenance of groundwater resources to meet backup, emergency, and peak demands without adversely affecting other groundwater uses within the WPCGMP area. Moreover, the WPCGMP provides a framework to coordinate groundwater management activities through a set of basin management objectives and specific implementation actions that were agreed to by all of the participants.

1.3 Plan Adoption

Prior to adoption of its 2015 UWMP, the City conducted a public hearing regarding its UWMP on July 12, 2016. Before the hearing, a draft of the UWMP was made available for public inspection on the City's website as well as at City Hall. General notice of the public hearing was provided through publication of the hearing date and time in the Lincoln News Messenger on **June 23 and 30**, 2016⁷ and posting of the hearing in City Hall.

As part of its public hearing, the City received community input regarding its implementation plan for complying with the water conservation requirements contained in CWC §10608.20 et seq., including the implementation plan's economic impacts.⁸ Prior to adopting the 2015 UWMP, the City considered the comments received. The resolution adopting the 2015 UWMP is included as **Appendix B-1**. Also, at the public hearing, the City presented the method for determining its urban water use target pursuant to CWC §10608.20(b), which it formally adopted on July 12, 2016.

The City of Lincoln adopted its 2015 UWMP on July 12, 2016. A copy of the final adopted 2015 UWMP will be provided to Placer County and the California State Library, and posted onto the City's website by July 28, 2016.

1.4 Previous Reports

The City and PCWA have prepared several water planning reports in the past decade. These documents provide context for the analyses contained in the City's 2015 UWMP. The City relied upon PCWA's 2006 Integrated Water Resources Plan (2006 IWRP) and PCWA's adopted 2010 UWMP and public draft 2015 UWMP. The City reviewed NID's 2010 UWMP as well as its draft 2015 UWMP. The City also has prepared several relevant documents including a 2050 General Plan, 2004 Master Reclamation Plan, and a 2008 Wastewater Treatment and Reclamation Facility Expansion Plan, and has participated in the 2007 Western Placer County Groundwater Management Plan and its related on-going efforts.

⁷ See **Appendix B-2** for copies of the published notices

⁸ CWC § 10608.26

The City has prepared urban water management plans in 2002, 2005 and 2010. The 2010 Plan concluded that the City has sufficient surface water supplies in normal, single dry and multiple-dry year periods. Under extreme dry conditions, PCWA and NID may reduce surface water deliveries to the City. But the City would be able to produce groundwater to make up for any possible shortage. Under a revised and updated 2016 demand and supply analysis for the 2050 General Plan, anticipated increases in PCWA deliveries, additional surface supplies from NID, groundwater resources, as well as a recycled water asset provide adequate water supplies to meet expected demands through 2050.

PCWA's water planning analyses assess water demands in western Placer County, including service to new development projects in current general plans and identified specific plan subareas that are located in western Placer County. PCWA also integrates a variety of water supplies managed by PCWA and other purveyors, including surface water, groundwater, and recycled water. In its comparison of demands and supplies throughout western Placer County, PCWA concludes that there are adequate water supplies to meet demands in normal years, and that PCWA's dry-year shortage policies will allow it to effectively manage the projected supply shortages in single and multiple-dry year periods such that it is able to deliver treated surface water to the City of Lincoln consistent with its contract. Moreover, NID has concluded that it has adequate supplies to meet its service area demands in even the driest years. As described in detail in the following sections, the City anticipates having a secure surface water supply to meet its demands for the duration of this UWMP's planning horizon and will continue to use groundwater to provide supplies during peak summer demand conditions, to manage periodic outages in surface water, and to augment shortfalls in surface water during extreme dry conditions and emergency conditions.

1.5 Plan Organization

This UWMP is organized as follows:

- ◆ Chapter 2 provides a description of the City's service area, demographic and population characteristics; climate; potable and non-potable delivery systems; recycled water; retail service expansion.
- ◆ Chapter 3 describes the City's current and future water supplies and the reliability of the supplies.
- ◆ Chapter 4 details the water demands on the City's system, including the past and future estimated demands.
- ◆ Chapter 5 provides information regarding the City's water demand management measures.
- ◆ Chapter 6 outlines the City's water shortage contingency plan.
- ◆ Chapter 7 compares the City's water supplies and demands in normal and dry years.

The Appendices include background information and supporting documents.

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CHAPTER 2. WATER SYSTEM INFORMATION

The City of Lincoln, originally surveyed by Theodore Judah in the 1850's, became a California Charter City in 1890. Issuing its first water bond in 1895, the City owns and operates a public water system that provides treated water directly to customers in the City's service area. The City also delivers recycled water from its state-of-the-art wastewater treatment and reclamation facility to agriculture near the City's wastewater treatment plant. The City has plans to expand the recycled water delivery system to include active parks, landscaping, golf courses, and industrial customers within and outside of the City's service area.

Potable water is supplied from PCWA, NID, and from City-owned wells throughout the City. PCWA provides treated water on a wholesale basis to the City. The City service area includes customers in both PCWA and NID service boundaries. Currently, NID raw water is purchased by the City and is treated and conveyed to the City through PCWA facilities. The agreement between PCWA, NID, and the City allows the City's customers to receive NID treated water without using a separate supply system. Details of this agreement can be found in **Chapter 3**. Discussions and associated analysis and environmental documentation to construct a new NID regional treated water supply system are underway and are expected to allow the NID supplies to be provided directly to the City within the planning horizon of this UWMP.

Based on the estimated build-out population of 131,000 reflected in the City's 2050 General Plan, the current population of over 45,000 indicates the City of Lincoln is about 34 percent of full build-out.⁹

The City serves over 15,000 water service connections (customer accounts). Of these, single-family connections total about 95 percent of the customer accounts, and 75 percent of annual water usage. The remainder of meter classes including, multi-family, commercial, industrial, schools, parks and landscape irrigation, makeup the remainder of the water use.

2.1 The City of Lincoln Service Area

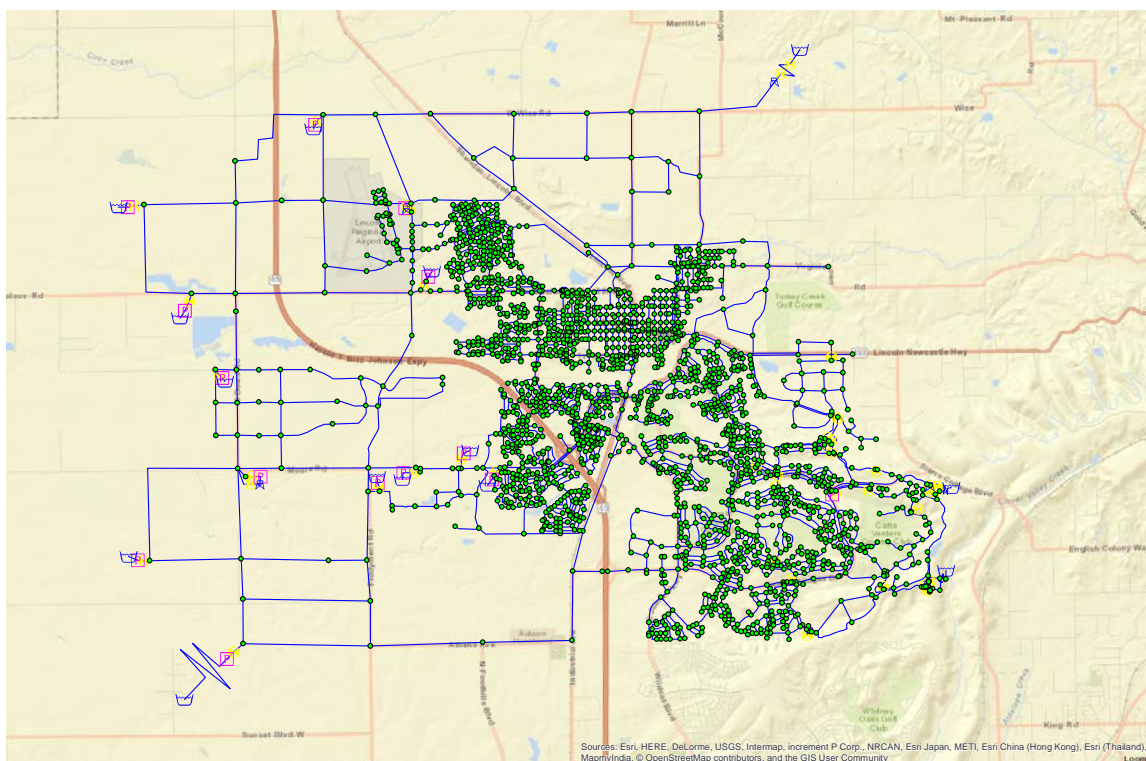
Figure 2-1 shows a generalized diagram of the City's existing treated water system. This diagram is derived from the City's water model that allows characterization of pipes and pipe sizes in the ground. Much of the information depicted here has been confirmed by City Staff that is engaged in maintenance and repair on an ongoing basis.

⁹ Recent land use plans for future developments at current housing densities have increased the projected build-out population to over 145,000. It should be noted that the 2050 population number from the General Plan still holds for an approximate population by 2050 based on the current growth projections.

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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Figure 2-2 – Future Lincoln Treated Water Distribution System



2.1.1 Climate

The climate in the City is typical to California's Central Valley with hot, dry summers and cool, humid wet winters. The rainy season begins in November and ends in March, with the lowest humidity occurring in the summer months.

Table 2-1 includes the average reference evapotranspiration (ET_o), precipitation and temperature for the associated area. For purposes of documenting ET_o, California Model Water Efficient Landscape Ordinance (MWELo) contains the reference ET_o by month, and directs parties to local data from a California Irrigation Management Information System (CIMIS) station.¹⁰ For the purpose of maintaining the most accurate values, the Fair Oaks CIMIS station data is presented as a basis for comparison.

Average precipitation and temperature data was also obtained from the CIMIS station 131 in Fair Oaks. The Fair Oaks-131 station was selected as the best representative of the Lincoln area, at a similar elevation, compared to the other three nearest the City. The Auburn-191 station, although the closest to the City is located in the foothills at a

¹⁰ Values in the MWELo, Appendix A match data from "Irrigation Scheduling" A Guide for Efficient On-Farm Water Management, University of California Division of Agriculture and Natural Resources, Publication 21454, published 1989. Because of this, CIMIS data from ongoing station monitoring is the preferred source of data for irrigation management.

significantly higher elevation. The Verona-235 station is on the Sacramento River. This location next to a large water body would likely reduce temperatures that would not be representative of the City temperatures. And the Browns Valley-84 station is located at a higher elevation than the City as well as at a higher latitude – neither of which are representative of the City’s climate.

For the period 1998-2015, average annual rainfall was measured as 18.72 inches. The wettest months are December, January and February, and the driest months are typically July and August. Evapotranspiration varies seasonally, and during a drought the significance of evapotranspiration is magnified because it continues to deplete surface and soil water supplies. The soils are not replenished by sufficient precipitation causing significant ET increases. The temperature and precipitation numbers are from Western Regional Climate Center (WRCC) data stations. The nearest station to Lincoln was active in Rocklin from 1971 to 2000 so more recent data has been used from a station in Fair Oaks. Temperature values are provided as monthly averages for high and low temperatures.

Table 2-1 – Average ETo, Rainfall, and Temperature

Month	Standard Monthly Average ETo ¹ (inches)	Average Rainfall ² (inches)	Average Temperature ³ (Fahrenheit)
January	1.15	2.79	47.1
February	1.74	3.61	50.8
March	3.31	2.44	55.3
April	4.53	1.78	58.5
May	6.47	0.73	65.6
June	7.46	0.14	72.2
July	7.95	0.02	76.2
August	7.02	0.00	74.8
September	5.18	0.07	71.4
October	3.36	1.08	63.1
November	1.64	1.89	53.0
December	1.04	4.18	47.4
Annual	50.85	18.72	61.3

1. DWR CIMIS Data, Fair Oaks Station #131, 1998-2010.

2. DWR CIMIS Data, Fair Oaks Station #131, 1998-2015.

3. DWR CIMIS Data, Fair Oaks Station #131, 1998-2015.

2.1.2 Service Area Demographics and Population

The population served by the City includes a mix of users and user classes. This includes residential, as well as commercial, public, and industrial customers. A population estimate for the City was obtained from the Department of Finance (DOF).¹¹ The DOF estimate reflects a population for the customers located inside the existing City limits. In addition to the customers served inside the City limits, the City serves an estimated 30 people located outside of the City limits. The historic population for the City's service area is presented in **Table 2-2**.

Table 2-2 also includes a population projection through the year 2040. Notably, this population estimate of approximately 102,500 persons is less than estimates compiled by the City over the course of the last 10 years. It should be noted, however, that the Sacramento Area Council of Governments (SACOG) projected a 2035 population of 112,209 persons as recently as 2008. SACOG prepared this estimate when the City was experiencing a very high growth rate, as shown by the historic population numbers. The lower numbers presented in **Table 2-2** represent a more realistic growth rate for the City based on actual development plans and a historic average 3 percent growth projection. The numbers in **Table 2-2** are consistent with the City's build out population in its General Plan, but do suggest that the build-out date will likely occur later than predicted just a few years ago.

Table 2-2 – Historic and Projected Population

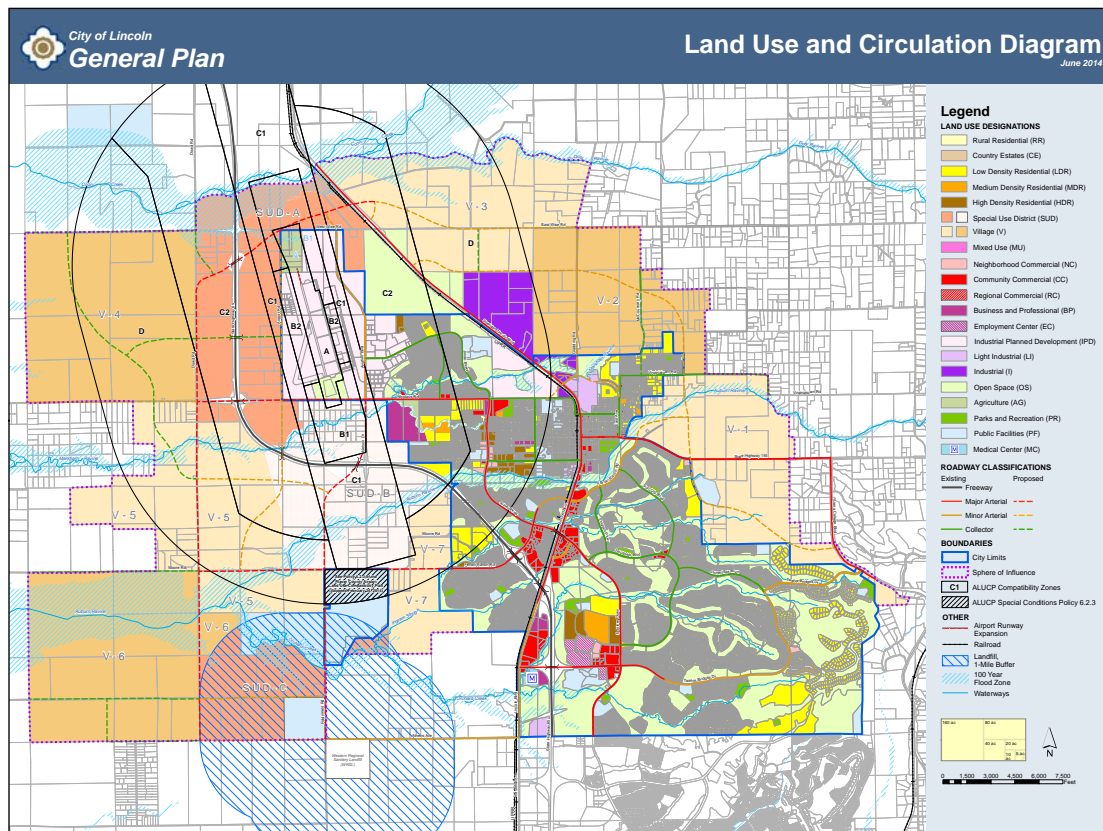
Year	Population	Year	Population
2005	27,433	2015	45,837
2006	33,619	2020	53,747
2007	37,455	2025	62,153
2008	39,636	2030	73,175
2009	40,532	2035	86,001
2010	42,819	2040	102,563
2011	43,142	BO	145,544
2012	43,915		
2013	44,336		
2014	45,259		
2015	45,837		

2.1.3 Land Use Maps

The City's General Plan land use map in **Figure 2-3** shows the City's land use as majority low density residential with significant transit oriented development around major streets.

¹¹ State of California, Department of Finance, E-4 *Historical Population Estimates for City, County and the State*.

Figure 2-3 –City of Lincoln General Plan Land Use Map



2.2 Potable Water Delivery System

The City's potable water supply system receives the majority of its supply from the PCWA Lower Zone 1 Foothill-Sunset-Ophir (F-S-O) treated water system. The PCWA F-S-O system diverts the majority of its water from the Bear River at Lake Spaulding, and from the American River at Auburn. The supplies also include NID supplies wheeled through PCWA's system. The City also, under normal conditions, obtains about 10 percent of its annual potable water supply from groundwater from the North American Groundwater Subbasin underlying the City limits. These supply sources are treated, stored, and distributed to City customers via a complex array of water facilities including over 200 miles of pipelines, two gravity water storage tanks, and a booster pumping facility.

2.2.1 General Description

PCWA has supplied treated surface water to the City since the 1970's. Prior to that time, the City obtained raw water from PCWA and its predecessors from the Caperton Canal on the eastern edge of the City limits, with City chlorination facilities nearby. The current PCWA/NID treated water supply is delivered to the City through two meters near the PCWA hydro-electric generating station on the eastern edge of the City. The two

meters have a combined capacity, and contractual limit, of about 18.5 million gallons per day (mgd). In 2013, the last year without drought impacts, about 14.6 mgd was delivered through the two meters during maximum day demand.

The current PCWA/NID treated water supply consists of raw water conveyed from NID to be supplied to the NID service area within the City's treated water service area via PCWA raw water conveyance to the PCWA Foothill Water Treatment Plant. After treatment the combined PCWA/NID water is delivered to the City through the two meters mentioned above. The amount of water delivered to the NID service area within the City is accounted for through City meter readings. The volume of NID raw water delivered and billed to PCWA is calculated from the City meter readings within the NID service area per the Temporary Water Sales Agreement Between the Nevada Irrigation District (NID), Placer County Water Agency (PCWA) and the City of Lincoln (Lincoln) from 2004.

The State Water Resources Control Board (SWRCB) issued a curtailment notification in 2014 and 2015 to PCWA and NID due to drought conditions which directed certain diverters to cease all surface water diversions off the American River, Yuba River, and Bear River watersheds under post-1914 appropriative water rights. The City was not adversely impacted by the curtailment orders as PCWA and NID reservoir storage and system operations had adequate supplies to keep deliveries available to meet the City's needs. The City did, however, implement the SWRCB-mandated water conservation regulations and continues to adhere to the Governor's ongoing drought management actions.

The City has five (5) groundwater production wells that are listed in **Table 2-3**. The groundwater system and groundwater rights are further described in **Chapter 3**. The current production capacity of active wells in the City is about 5,800 gpm (about 3 MGD at 8.5 hours per day of operation). The fully operational, pressure actuated wells are used for peak management, emergencies and backup to PCWA/NID supplies. Groundwater delivered by the City of Lincoln is regularly tested and meets all drinking water standards.

The City's water transmission consists of both a distributed and centralized supply. The centralized supply originates with the PCWA meters feeding a City storage tank (5 million gallon capacity) located on the easterly edge of the City where adequate elevation is available for gravity flow to most City customers. The groundwater production wells are spread out in the distribution system, located on the westerly half of the City where the aquifers are the most productive. The City has an 18-inch emergency intertie with PCWA on the City's southeasterly boundary near the City of Rocklin.

The City transmission lines range in size from 20-inch to 30-inch pipelines. The majority of the buried distribution infrastructure components are water supply mains ranging in size from 4-inch to 18-inch pipe.

The existing City piped water system consists of several types of pipe materials ranging from steel pipe installed in the pre-1950s to asbestos-cement of the 1960's and 1970's to the ductile iron and PVC plastic pipe installed as the City standard today.

Table 2-3 – City Wells

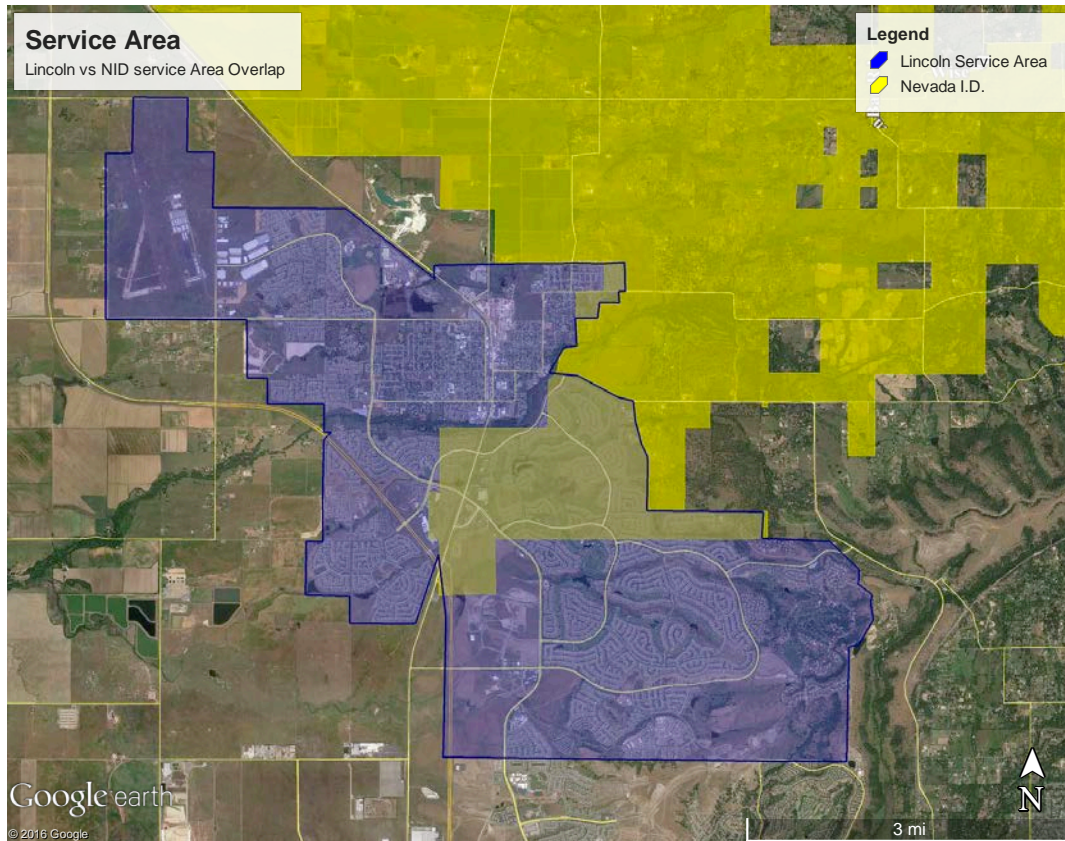
Well Name	Max. Production (gpm)	Year Built	Status
Nicolaus (Well #2)	900	1984	Active
Westwood (Well #6)	1,000	2000	Active
Moore (Well #7)	1,000	2002	Active
Fiddymment (Well #8)	1,400	2004	Active
Nelson (Well #9)	1,500	2005	Active
Subtotal	5,800		
Well #4	n/a	1999	Inactive
Well #5	n/a	1999	Inactive

* - Groundwater quality from the City wells meets State standards and requires only on-site disinfection

2.2.2 Service Area Map

Lincoln's potable water service area is depicted in the Map in Figure 2-4 below

Figure 2-4 – Potable Water Service Area Map



2.3 Non-Potable Water Delivery Systems with the City of Lincoln

The City holds a raw water contract with PCWA for deliveries from Caperton Canal. The City maintains a seasonal 2 miners-inch per day (32,586 gallons per day) contract with PCWA. This water delivery is not incorporated into the UWMP analysis. The City also has a recycled water system to deliver recycled water from its wastewater treatment facilities that is described in more detail in **Chapter 3**.

Raw water contracts from PCWA and NID supply various users within the City Limits and Sphere of Influence. NID serves a few customers in the City's boundary and SOI from its Hemphill Canal and Lincoln Canal. These customers include the Turkey Creek Golf course north of Highway 193, a church, and a Del Webb Golf Course south of Highway 193 and the Auburn Ravine. PCWA raw water customers within the City that have separate water supply agreements with PCWA include the Twelve Bridges Golf Course and Del Webb Golf Course.

2.4 Retail Service Area Expansion

The City of Lincoln grew rapidly in the last decade. The population increased from about 11,000 to 40,000 persons between 2000 and 2009.¹² During that time period the City experienced unprecedented growth that required significant expansion of the retail water distribution system. The current population, as shown in **Table 2-2**, is approaching 46,000 people. The infrastructure costs for service area expansions that are not covered in individual development agreements are paid for through the City's Connection Fee and its Source Water Capacity and Transmission charges on an equivalent dwelling unit (EDU) basis. These fees are currently \$5,839 and \$15,320 respectively per EDU.¹³

To plan for development projects, the City enters into Development Agreements with those proposing new residential and non-residential projects. A Development Agreement typically requires a developer to construct, or provide funds for, the construction of the following water supply related items:

- ◆ Water storage facilities
- ◆ Municipal well construction
- ◆ Water transmission facilities
- ◆ Dedication to the City of water rights to groundwater underlying the project

Despite having a secure groundwater supply, the City is unlikely to supply water to a new isolated development by simply installing a well. The manageable size of the service area makes it efficient for the City to connect new development to the City's primary distribution system while maintaining system wide water quality and groundwater backup facilities.

¹² State of California, Department of Finance, E-4 Historical Population Estimates for City, County and the State, 1991-2000, with 1990 and 2000 Census Counts. Sacramento, California, August 2007.

¹³ Fees are slightly higher for some larger home sites. Costs are valid as of April 2016.

CHAPTER 3. WATER SUPPLY CHARACTERISTICS

3.1 Introduction

Chapter 3 describes the City of Lincoln's (City) existing and planned supplies for the 25 year period covered in this Urban Water Management Plan (UWMP). The water supplies that are used within the City and its Sphere of Influence (SOI) are derived from Placer County Water Agency (PCWA), Nevada Irrigation District (NID), groundwater, and recycled water. All water supplies derived from these sources are managed in order to best meet the City's demands in different year types, reduce delivery costs, manage water quality issues, and handle drought and emergency situations. As such, water deliveries from each identified source may fluctuate in any given year because of management decisions, regulatory constraints, and hydrological conditions.

The water derived from these sources constitute the City's water supply portfolio and are described in more detail in the sections below. Each asset is derived from specific water rights, contracts, and planning arrangements that are subject to specific regulatory rules and contractual constraints. Some water assets that enter the City and its SOI are not controlled by the City yet may influence the City's water management activities among the water assets that the City does control. Nevertheless, the diversity of water assets available to the City in its water supply portfolio as well as the volumes of water controlled by its wholesale providers, make the City of Lincoln's water supplies available to meet its demands in normal years, a single-dry year, and multiple-dry years.

3.2 Historical Potable Water Supplies

The City's water supplies have historically included water supplies that are treated and delivered through PCWA's treatment and conveyance system. The water that is treated and delivered to the City consists of PCWA surface water rights and entitlements as well as Nevada Irrigation District (NID) water rights and entitlements. Under current contractual and operational conditions, PCWA's and NID's wholesale water assets are commingled in PCWA's treatment and conveyance system before they are delivered to the City. The City also uses groundwater during periods where treated surface water through PCWA's system is reduced as well as to manage summer maximum day and peak hour water demands. **Table 3-1** shows the City's annual surface water and groundwater potable water supply volumes that are used to meet the City's treated water demands.

Table 3-1 – City of Lincoln Historic Water Supplies

Year	Supply (AF)		
	Ground water	Surface Water	Total Supply
2006	623	8,753	9,376
2007	924	9,396	10,320
2008	1,085	9,437	10,522
2009	836	9,319	10,155
2010	962	8,241	9,203
2011	2,561	6,815	9,376
2012	2,722	7,236	9,958
2013	1,066	9,416	10,483
2014	691	8,257	8,948
2015	707	6,921	7,628

The City generally only purchases and delivers water that is necessary to meet the City’s customers’ demands. Historically, the City relied upon significant quantities of groundwater to meet demands but has since transitioned to acquiring surface water assets from PCWA and NID. Although the City may have the capability to access and use additional supplies from its various water sources, its operational relationships with its wholesale providers as well as its groundwater management foster a tempered approach – where the City acquires only those water assets that the City needs to meet its demands.

3.3 Existing Water Supplies and Entitlements

There are six primary water rights and entitlements (collectively, “water supplies”) that are used within the City’s existing service area and SOI. All six of these water supplies are used to meet the water demands for the City’s residents. And, in several areas within the City and its SOI, the water supplies can be interchanged for deliveries to certain water users. The water supplies are:

- ◆ PCWA contract entitlement
- ◆ NID contract entitlement
- ◆ Groundwater rights
- ◆ Recycled water rights
- ◆ PCWA raw water entitlements
- ◆ NID raw water entitlements

Each of these water supplies are subject to a unique set of conditions based upon their underlying water rights, the regulatory environment, the contractual limitations, and the City’s ability to access and deliver the supplies to meet targeted end-user needs. Within this structural framework, the City manages its water assets to meet its customer’s needs.

Importantly, the structural framework morphs and changes requiring the City's water managers to adjust water asset management and system operations.¹⁴

3.3.1 PCWA Treated Water Supply Contract

In 2012, the City entered a water supply contract with PCWA for delivery of treated surface water.¹⁵ The PCWA Contract entitles the City to a Maximum Delivery Entitlement of 18,501,424.5 gallons (or 18.5 million gallons) of treated water supply.¹⁶ The contract distinguishes between regulated and unregulated deliveries as follows:

- ◆ Maximum day Regulated Deliveries of **17,774,452** gallons per day; and
- ◆ Maximum day Unregulated Deliveries of **726,972.5** gallons per day.

Regulated water deliveries are those deliveries where the City uses its system operations to deliver water on a demand pattern for certain uses within the City. Specifically, the City uses its facilities to regulate pressure and accommodate peak demands. Unregulated water deliveries are those water deliveries that are made to the City where PCWA uses its system operations to manage the water deliveries. PCWA's unregulated deliveries currently serve the City's "high elevation lots" generally in the Catta Verdera area.¹⁷ The contract also contains opportunities for the City to purchase additional supplies beyond the Maximum Delivery Entitlement identified in the PCWA contract.

The City's PCWA contract provisions require PCWA to deliver water up to the max day delivery amount to the City for use in the City's service area. The contract contemplates delivery of water supplies derived from PCWA's water rights and entitlements as the basis for the supplies coming to the City. Water from PCWA is treated at PCWA's Foothill Water Treatment Plant and is then delivered to the City. The contract has a term of 20 years and a right of renewal for successive 20 year periods.

The maximum day water supply delivered to the City from PCWA's system is measured at the Lincoln Metering Station. In 2013, the most recent year without mandatory drought reductions, the City's max day regulated use under the contract was 13,944,160 gallons and the max day unregulated water use was 605,716 gallons. This delivery included water derived from NID's water assets – which is described in more detail below.¹⁸ The maximum day measurement – is just that – the single day in the calendar year when the City uses the most water as measured at the Lincoln Metering Station. As

¹⁴ The City is investigating additional water assets that may be included in its water supply portfolio.

¹⁵ The Contract is titled: "Contract between Placer County Water Agency and the City of Lincoln for a Treated Water Supply" dated November 13, 2012. (Hereafter, "PCWA Contract"). This contract is available from the City upon request.

¹⁶ Article 5(b) PCWA Contract

¹⁷ Article 5(c) PCWA Contract

¹⁸ PCWA Letter at page 1.

such, the max day water use can be modified depending upon which sources of water are used during specific times of the year and managing the timing of peak demand on the City's system.

In 2015, PCWA indicated that the City's remaining unused peak flow capacity under its contract was approximately 3.8 million gallons on the regulated side and 121,000 million gallons on the unregulated side.¹⁹ PCWA estimated this amount based upon 2013 demand figures – the last normal water year where demand reductions were not mandated by the State of California. The PCWA Letter indicates that PCWA has additional future treatment and delivery capacity of approximately 3.86 million gallons per day (mgd) of unallocated capacity at its Foothill Water Treatment Plant and Sunset Water Treatment Plant.²⁰ The recent treated water supply quantities delivered by PCWA to the City are shown in **Table 3-2**.

**Table 3-2 – Historic PCWA Water Supplies
Delivered to the City of Lincoln**

Year	Supply (AF)
2006	6,940
2007	7,736
2008	7,779
2009	7,724
2010	6,630
2011	6,815
2012	7,236
2013	9,416
2014	8,257
2015	6,921

3.3.2 PCWA Water Rights

Importantly, the City's water supplies contemplated in the PCWA Contract for delivery to the City are grounded in PCWA's water rights and contracts. In other words, the reliability of water supply delivery to the City is grounded in the underlying water rights and contracts held by PCWA.

PCWA's surface water supplies consist of water from the North Fork American River and its tributaries – including water stored in its Middle Fork Project (MFP) – under water right Permits 13856 and 13858; Central Valley Project (CVP) project supply under

¹⁹ Letter to Matthew Brower from Brent Smith dated March 1, 2016 at page 2. (Hereafter, "PCWA Letter").

²⁰ PCWA Letter at page 2.

CVP Contract 14-060200-5082A from the American River; and water purchased from Pacific Gas & Electric Company (PG&E) from the Yuba and Bear Rivers under two contracts: the 1982 Zone 3 Contract Purchase Agreement and the February 27, 2015 Water Supply Agreement. PCWA uses a limited amount of surface water from small creeks under its pre-1914 appropriative water rights.

Permits 13856 and 13858

PCWA's Permits 13856 and 13858 are post-1914 appropriative water rights subject to State Water Resources Control Board (SWRCB) jurisdiction. Post-1914 water rights are those water rights created after the formation of the SWRCB (in 1914) and are regulated by the SWRCB as an administrative body within California's Executive Branch. California's SWRCB-governed water rights system consists of a three step water right staged process – application, permit and license stages. PCWA's water rights are in the permit stage, meaning that PCWA has not yet put the water supplies it applied for under its applications and was granted to use under its permits to full beneficial use. PCWA is engaged in a "permit renewal process" whereby it is working with SWRCB to extend the time limitations placed upon it to fully utilize the water.

Permits 13856 and 13858 have diversion priority dates of April 7, 1958 and April 8, 1958, respectively. These priority dates are generally junior in priority to many other water rights on the American River system and are junior in priority to the Central Valley Project (CVP) water rights that constitute the Folsom Reservoir diversions to serve CVP customers throughout California. PCWA diverts water under these rights to its Middle Fork Project storage reservoirs for use throughout the year. In 2014 and 2015, two of the driest years on record, PCWA's water rights were curtailed from direct diversion or diversion to storage through SWRCB orders.

PCWA may use water under its permitted water rights in western Placer County, as well as portions of northern Sacramento County, including San Juan Water District, Sacramento Suburban Water District, and Rio Linda/Elverta Community Water District service areas. PCWA's wholesale customers include the City of Roseville, San Juan Water District, and the Sacramento Suburban Water District. PCWA has signed an agreement with the United States Bureau of Reclamation (Reclamation) limiting its diversions under PCWA's permitted rights to 120,000 af/yr off the American River for use within the current PCWA place of use.

The Water Forum Agreement (WFA) may reduce the water available under these Permits in certain years. The WFA requires PCWA to release up to 47,000 acre-feet of additional water in drier years through reoperation of MFP reservoirs (27,000 acre-feet for PCWA and 20,000 acre-feet for the City of Roseville) to replace water diverted above the WFA

1995 baseline volumes.²¹ When projected March through November Unimpaired Inflow to Folsom Reservoir (UIFR) is between 950,000 acre-feet and 400,000 acre-feet, the amount of these additional water releases is linearly interpolated between 0 acre-feet and 47,000 acre-feet. When projected March through November UIFR is less than 400,000 acre-feet, it is considered a “conference year” where Water Forum participants meet to determine how best to manage the available water, recognizing that there may not be sufficient water to meet both deliveries and environmental release requirements specified in the agreement. Both 2014 and 2015 were “conference years” under the WFA.

Several additions to PCWA’s diversion and conveyance infrastructure will need to be made in order to acquire all of PCWA’s MFP water supplies under its Permits. The American River Pump Station will need to be expanded and Ophir Water Treatment Plant would need to be built. Assuming that these items move forward, watershed modeling indicates that Middle Fork Project water supplies could be reduced by as little 33% in dry years based on PCWA’s water storage capabilities. Thus, PCWA anticipates the reliable dry year supply under Permits 13856 and 13858 to be 80,400 afy.

Central Valley Project Contract

PCWA has a Central Valley Project (CVP) water contract with the United States Bureau of Reclamation (Reclamation) for delivery of up to 35,000 af/yr for Municipal and Industrial purposes, including groundwater recharge programs that are consistent with applicable State law. The term of the CVP contract, Amendatory Contract 14-060200-5082A, was through 2011, but included a long-term renewal provision. The contract has been extended through three two-year interim renewal contracts since 2011 until a long-term renewal contract can be implemented by Reclamation. The long-term renewal is pending resolution of issues regarding environmental documentation associated with the CVP. The current interim contract is good through February 28, 2018.²²

PCWA’s point of diversion for CVP water is Folsom Dam, but the contract also includes potential for other diversions, including the Sacramento River, if the points of diversion are agreed to by the Contracting Officer. PCWA does not currently own or control facilities that are capable of conveying CVP water from Folsom Dam or the Sacramento River to the PCWA service area. As such, the availability of the water supply is currently affected by physical limitations. PCWA is engaged in negotiations with the City of Roseville and other regional entities to potentially utilize existing facilities to divert and deliver PCWA’s CVP project water supplies. The CVP contract identifies only a portion of PCWA’s Zone 1 service area as the area available for water deliveries from CVP Project supplies.

²¹ PCWA’s baseline volume is 8,500 af/yr. The City of Roseville’s baseline volume is 19,800 af/yr.

²² Contract No. 14-06-200-5082A-IR3 dated March 1, 2016.

Article 3(b) of the CVP contract indicates that of the 35,000 af/yr identified in the contract, the amount of water that would likely be delivered in normal years is 32,000 acre-feet.²³ Reclamation reserves the right to apportion the available CVP water supply among PCWA and other CVP water contractors under Reclamation's Municipal and Industrial Water Shortage Policy (M&I WSP). The M&I WSP generally defines water service terms and conditions under drought conditions. The M&I WSP is valid through 2030. Generally, reductions in M&I deliveries should not exceed 25 percent, unless conditions are severe. In 2015, M&I WSP allocations on the American River watershed were 25 percent of the historical use – meaning 25 percent of the last three normal years average use adjusted for identified variables.

PCWA anticipates that in dry years its CVP Project Supply would be reduced by approximately 50%. Accordingly, the dry year supply is approximately 16,000 acre-feet per year.

PCWA Pacific Gas & Electric Contracts

PCWA has two water supply contracts with PG&E that provide opportunity to purchase up to 125,400 af/yr for irrigation and domestic purposes. For practical purposes, the delivered supply has historically peaked at 110,400 af/yr. The underlying rights for the PG&E supply are PG&E's pre-1914 appropriative rights to water in the Yuba and Bear Rivers, which were established prior to the time that PG&E developed hydroelectric facilities throughout the Yuba and Bear River watersheds.

The water supply that PCWA purchases from PG&E is used to meet both treated and raw water demands within PCWA's Western Water System. In 1968, PCWA purchased PG&E's lower Placer Water System, including its distribution canals and treated water systems as well as rights to delivery of 100,400 af/yr of water from PG&E's Drum-Spaulding Project to serve PCWA customers in the Western Water System area. This supply generally serves PCWA customers in Western Placer County.²⁴

PCWA and PG&E entered a new Water Supply Agreement on February 29, 2015. In Article II of the Agreement, PG&E will continue to deliver 100,400 acre-feet of water to PCWA from the Drum-Spaulding Project. PCWA will purchase this water during a water contract year from (Oct 1 to Sept 30 of the following year). PCWA is also entitled to purchase additional water if made available by PG&E. In the Agreement, however, PG&E:

²³ Contract No. 14-06-200-5082A-IR3

²⁴ The demarcation for Western Placer County is the service area line separating PCWA's Zone 3 from Zone 1 customers as depicted in **Appendix C-1**.

- ◆ grants PCWA and NID right of first refusal for surplus water²⁵
- ◆ has no obligation to deliver water of a particular quality²⁶
- ◆ takes no responsibility for defects in its water rights²⁷ and
- ◆ may suspend deliveries in case of “any stoppage and/or impairment in the flow of water except to the extent to extent such stoppage and/or impairment results from a of breach...under this Agreement.”²⁸

The 2015 Water Supply Agreement terminates upon “the expiration date of the New FERC License....”²⁹

The Drum-Spaulding Project consists of 29 reservoirs, 6 major water conduits, 12 powerhouses as well as other water infrastructure, power, and recreation related facilities. In 2014, the Drum-Spaulding Project was divided into three distinct projects for purposes of Federal Energy Regulatory Commission (FERC): Upper Drum-Spaulding, Lower Drum, and Deer Creek hydroelectric projects.³⁰ Although the systems are currently operating on annual FERC license renewals, when the final FERC licenses are issued they will have a term between 30 and 50 years.

The Upper Drum-Spaulding, Lower Drum, and Deer Creek hydroelectric projects are FERC licensed facilities and are subject to the terms and conditions of the three FERC Licenses affecting their operations. In concert with the terms of these licenses, PG&E provides wholesale water to PCWA for consumptive uses in PCWA’s service area. While federal law allows for FERC to adopt permit conditions that mandate minimum flows, reservoir levels or set temperature limitations related to operation of a hydroelectric facility, these provisions should not affect the appropriation and distribution of water for consumptive purposes at this time.³¹ Future conditions in the FERC License renewal process could impact deliveries for consumptive purposes.

In 1982, PCWA purchased the remainder of PG&E’s Upper Placer Water System.³² In the PG&E and PCWA Purchase Agreement, PG&E agreed to deliver as much as 25,000 acre-feet per year from PG&E’s Drum Spaulding Project as part of the Upper Placer Water System conveyance.³³ PCWA typically acquires 10,000 acre-feet during normal

²⁵ 2015 Water Supply Agreement, Article II, paragraph 2.3

²⁶ 2015 Water Supply Agreement, Article II, paragraph 2.4

²⁷ 2015 Water Supply Agreement, Article III, paragraph 3.4(c)

²⁸ 2015 Water Supply Agreement, Article IX, paragraph 9.1

²⁹ 2015 Water Supply Agreement, Article I, paragraph 1.2

³⁰ NID’s Yuba-Bear hydroelectric project is also incorporated into the Final FERC EIS.

³¹ 16 U.S.C. § 821.

³² Purchase Agreement between Pacific Gas and Electric Company and Placer County Water Agency dated November 17, 1982 (hereafter “PG&E and PCWA Purchase Agreement”).

³³ PG&E and PCWA Purchase Agreement at Exhibit A.

years. PCWA generally delivers water under this Agreement to customers in its Zone 3 service area – outside the boundaries of the City of Lincoln or its sphere of influence.

PG&E's pre-1914 water rights and supplies delivered through its system under these water rights are highly reliable during normal, single-dry and multiple-dry year periods. Between 1987 and 1992, when the State of California experienced a 5-year drought, PCWA had a full Yuba/Bear river supply each year. In the 2015 water year, one of the driest years in California's history, PG&E delivered 76,119 acre-feet of water to PCWA – 68.9 percent of the 110,400 acre-feet that PCWA anticipates each year. This reduction represents significant supply reliability as compared to other sources of water in California in 2015 where supplies were reduced to a much greater extent (even zero in some cases). Nevertheless, for conservative long-term planning purposes, PCWA anticipates that it will experience a 50 percent reduction in its PG&E supply in single dry years and a 25 percent reduction in multiple dry years equating to 55,200 acre-feet and 82,808 acre-feet respectively.³⁴

PCWA Pre-1914 Appropriative Water Rights

PCWA also possesses four pre-1914 appropriative water rights for diversion of water from various small creeks and their tributaries in western Placer County. These rights are generally for agricultural purposes – including stockwatering and irrigation. In 2014, the combined diversion for all four water rights approximated 2,500 acre-feet. These water supplies are not used in PCWA's treated water system. It is unclear whether they are used in PCWA's raw water conveyance through the Caperton Canal

PCWA Water Supply Summary

PCWA anticipates that it will have approximately 252,000 acre-feet of surface water available in normal years and approximately 146,000 acre-feet of surface water available in dry years for its wholesale, retail, and raw water deliveries. **Table 3-3** below depicts PCWA's available supplies for the City of Lincoln.

³⁴ These numbers represent the combined PCWA PG&E contract supplies. For purposes of this UWMP we use the same reduction percentages as applied to the Zone 1 supplies only. These numbers are shown in **Table 3-3**.

Table 3-3 - PCWA Available Surface Supplies³⁵

Supply	Average/ Normal af/yr	Single Dry af/yr	Multiple Dry Water Years		
			Year 1 af/yr	Year 2 af/yr	Year 3 af/yr
Pacific Gas & Electric	100,400	50,200	75,300	75,300	75,300
Middle Fork Project	120,000	80,400	120,000	120,000	120,000
Central Valley Project	32,000	16,000	23,250	23,250	23,250
Total	252,400	146,600	218,550	218,550	218,550

At build-out, the City anticipates relying upon as much as 34,000 acre-feet per year of water from PCWA as part of its water supply portfolio necessary to meet its municipal and industrial demands. Although the City's contract with PCWA does not guarantee that this amount will be available, PCWA's 2015 UWMP as well as its MFP Permit renewal efforts indicate that the quantity desired by the City will be available at build-out of the City's general plan area as defined by the Adopted 2008 General Plan Update.

3.3.3 NID Surface Water Contract and PCWA Delivery Contract

NID supplies irrigation, wholesale, and retail water to Nevada County and Placer County customers. Agricultural water use accounts for nearly 90 percent of the total demand on NID water supply. The remaining water supplied to Placer County residential customers by NID is primarily delivered directly through PCWA's system to single-family residential accounts. NID's mountain watersheds cover 70,000 acres and include the upper portions of the Middle Yuba River above Milton Diversion, Canyon Creek above Bowman Reservoir, and Deer Creek.

The City and Nevada Irrigation District (NID) entered a temporary water supply contract for water deliveries to NID customers and developments that will be incorporated into the City's service area upon annexation. Through this agreement, NID provides additional surface water to the City for deliveries into the NID service area. The water contemplated in this agreement is provided by NID to PCWA for treatment and delivery to the City.

The amount of water available to the City from NID is quantified as approximately 12,000 acre-feet based on the City's long-term demand estimates. Historically, NID has delivered through PCWA's system as much as 1,920 acre-feet of water to NID's service area within the City's boundaries. The actual amount of water that will be available to

³⁵ As described in Section 3.3.2, availability of CVP supply requires necessary diversion and conveyance infrastructure to be built. And full diversion of the MFP requires additional conveyance capacity at the American River Pump Station as well as construction of Ophir Water Treatment Plant.

the City in the future, however, has not been finalized and the existing agreement has no clause expressly quantifying the available supply.³⁶

Nevertheless, NID's 2015 Draft UWMP posits that water shortages to its overall water supply would only occur in the driest of years. In 2015, the driest year in California's history, NID experienced no water shortages. All reductions in deliveries to end-users were mandated by SWRCB regulations requiring reductions in consumptive use. However, in the event that shortages were to occur, NID would equally reduce water supplies between its domestic water customers and the City.

In September 2004, the City, PCWA and the Nevada Irrigation District (NID) entered into a temporary raw water sales agreement pursuant to which NID supplied raw water to PCWA treatment facilities for delivery within the City's water service area. **Table 3-4** below summarizes NID water deliveries into the City's service area from 2008 until present. The delivery mechanism for these supplies has been PCWA's treatment and delivery systems.

**Table 3-4 – Historic NID Water Supplies
Delivered to the City of Lincoln³⁷**

Year	Supply (AF)
2008	1,664
2009	1,602
2010	1,481
2011	1,123
2012	1,298
2013	1,920
2014	1,640
2015	1,497

The City and NID are jointly planning a separate water treatment plant that would serve NID water and potentially PCWA water to various areas in Lincoln and Lincoln's SOI. This proposed facility could deliver approximately 17,500 acre-feet of water per year. The City negotiated a Water Facilities/Planning Phase agreement with NID in 2007 to

³⁶ Paragraph 6 of the NID-Lincoln contract states: "Raw water delivered by NID under this agreement is subject to scheduled and unscheduled outages. It will be PCWA and/or Lincoln's responsibility to provide an alternate treated water supply during such outages so that deliveries to Lincoln's customers by NID will not be disrupted." Paragraph 10 of the contract states: "This agreement is intended to be a temporary agreement to be in effect until such time as NID constructs a treatment plant and other facilities sufficient to enable NID to supply treated water to Lincoln for those customers within Lincoln that are also within NID's boundary."

³⁷ Historic NID water supplies delivered to the City of Lincoln include 10% above metered amounts to account for delivery losses. Actual water use in the NID service area within the City and SOI has been higher than total NID water deliveries through the PCWA system because of other NID raw water deliveries to those locations.

establish a conceptual framework for the design and construction of a new \$235 million water treatment facility.³⁸ The preferred location for the new plant is near NID's Valley View site located northeast of the City, as identified in the *Lincoln Area Water Treatment Plant Planning and Site Study* (2005). The proposed treatment facility would allow NID to serve treated water within the NID service area to customers in the Lincoln SOI rather than wheeling that water through PCWA's system.

NID is currently working on completing the planning, design studies, and engineering details necessary to better define the project and its alternatives. Once this step is complete, NID plans to move forward with the environmental review process. NID had planned to start operating the plant by 2015 but that deadline has passed. NID expects the planning, design, engineering, environmental review, and permitting to take many years. However, in the interim, the existing agreement to route NID water through PCWA treatment facilities for delivery to the City will serve as the mechanism for NID to provide water to its service area within the City.

3.3.4 NID Water Supplies

NID's water supplies consist of a variety of water rights and contracts that implicate the reliability of these supplies for current and future deliveries to the City. Specifically, NID has numerous pre-1914 appropriative water rights to waters in the Yuba River, Bear River and Deer Creek watersheds as well as post-1914 appropriative water rights to waters in the same watersheds. Collectively, these appropriative water rights allow for water diversions and collections to storage approximating 450,000 acre-feet of water each year. In addition to these rights, NID has a water supply contract with Pacific Gas & Electric Company for as much as 54,000 acre-feet of water as well as riparian rights that can be used for riparian purposes.³⁹ All of the relevant assets are described in more detail below.

NID Watershed Runoff Supplies

Nevada Irrigation District holds 25 pre-1914 appropriative water rights (pre-1914 rights) to the waters of the Yuba River, Bear River and Deer Creek watersheds. Pre-1914 appropriative water rights are not subject to the jurisdiction of the State Water Resources Control Board (SWRCB). In other words, SWRCB does not have the authority to determine where the pre-1914 rights are diverted, how they are used, or where they are used so long as those uses (or changes to those uses) do not injure other legal users of water. Moreover, the senior nature of these water rights under California's water rights

³⁸ This can be found on the City of Lincoln's website.

³⁹ This UWMP will not assess the NID's riparian water rights as those water rights cannot be diverted to storage nor can they be used on lands within the City's service area. Although they are an important component of NID's water supply portfolio, they are not particularly relevant for assessing supply reliability to NID's deliveries to the City.

system makes them extraordinarily valuable. Specifically, water rights junior in priority to NID Pre-1914 rights on these watersheds (all post-1914 appropriative rights) must be curtailed before a single pre-1914 water right is curtailed. The water rights senior status makes them highly reliable during drought conditions.

NID also holds 28 post-1914 appropriative water rights to the waters of the Yuba River, Bear River, and Deer Creek watersheds. Post-1914 appropriative water rights are subject to SWRCB jurisdiction. The rights generally identify a point of diversion, purpose(s) of use, and place of use in order to assure other users about the availability of their water supplies. Changes in the use of these water assets is not permitted without SWRCB's consent.

Some of NID's pre-1914 and post-1914 appropriative water right assets are for power production purposes. This non-consumptive use of water essentially allows for the diversion and storage of water so that releases can be made for power generation purposes through surface water reservoirs. Non-consumptive water rights are relevant to this analysis only in that they determine the amount of water that can be held in storage and released for consumptive purposes within and outside of NID's service area.

Collectively, NID refers to all of its appropriative water rights as "watershed runoff."⁴⁰ Watershed runoff is NID's primary water supply. The amount of watershed runoff depends on the annual snowpack and the rate of snowmelt. In 2015, the total runoff available to NID was 77,378 acre-feet while in wet years watershed runoff has neared 470,000 acre-feet. Average runoff is approximately 221,500 acre-feet per year.

NID Carryover Storage

NID operates a system of surface water storage reservoirs directly related to its appropriative water rights. The nine reservoirs, with a combined storage capacity of 279,985 acre-feet include: Jackson Meadows, Bowman, Jackson Lake, Sawmill, Faucherie, French, Rollins, Scotts Flat, and Combie. **Table 3-5** shows the reservoirs and their storage capacity.

⁴⁰ Nevada Irrigation District Draft 2015 Urban Water Management Plan.

Table 3-5 – Water Supply Reservoirs

Reservoir	Capacity, ac-ft
Jackson Meadows	69,205
Bowman	68,510
Jackson Lake	1,330
Sawmill	3,030
Faucherie	3,980
French	13,840
Rollins	65,988
Scotts Flat	48,547
Combie	5,555
Total Capacity	279,985

NID holds its total carryover storage in its reservoir system to not less than 78,000 acre-feet annually. NID's forty-seven year carryover storage average is 129,400 acre-feet per year.

NID Pacific Gas & Electric Contract

NID and PG&E have water supplies that commingle in the context of both entities power production systems in the Yuba-Bear River watershed. PG&E has agreed to supply NID as much as 54,361 acre-feet of water per year from its water rights water in the Yuba-Bear system. This supply, however, is underutilized because there are significant conveyance restrictions in the delivery system. Specifically, conveyance restrictions reduce the available supply to approximately 8,000 acre-feet per year.

NID Water Supply Summary

NID anticipates that it will have approximately 477,000 acre-feet of water available in normal years and approximately 359,000 acre-feet available in dry years for its wholesale, retail, and raw water deliveries. **Table 3-6** below shows NID's normal year, single dry year, and multiple dry year supply reliability forecast.

Table 3-6 – NID Available Water Supplies

Supply	Average/ Normal af/yr	Single Dry af/yr	Multiple Dry Water Years		
			Year 1 af/yr	Year 2 af/yr	Year 3 af/yr
Watershed Runoff	221,500	221,500	221,500	221,500	221,500
Carryover Storage	201,985	129,400	129,400	129,400	129,400
PG&E Contract	54,361	8,000	8,000	8,000	8,000
Total	477,846	358,900	358,900	358,900	358,900

3.3.5 Groundwater Supplies and Management

The purposes of this section are to describe the groundwater basin, the City's well system and well operations in the basin, and the governance structure of the groundwater basin. All of these issues are pertinent to the City's long-term groundwater supply availability.

Groundwater Basin

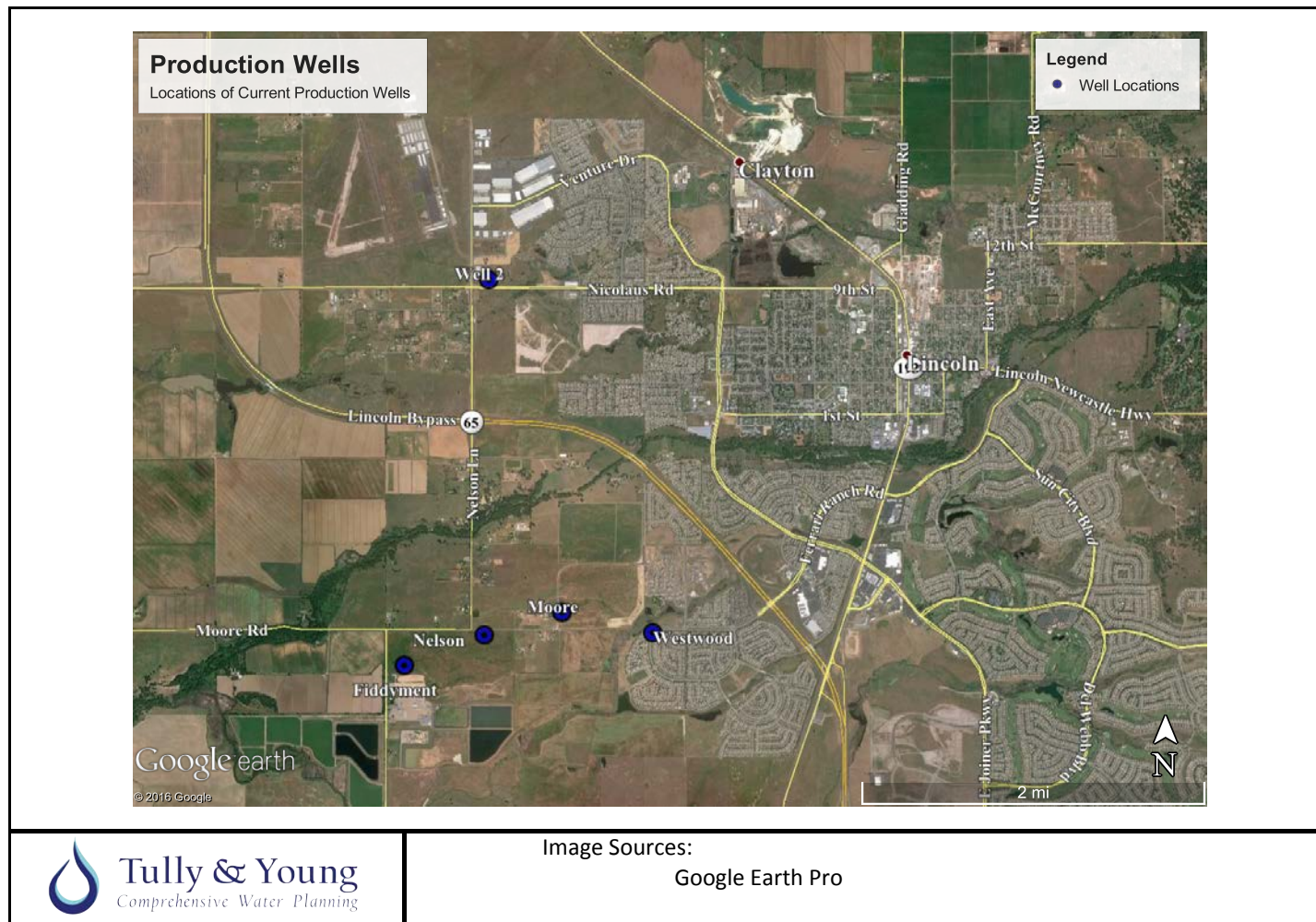
The Central Valley Groundwater Basin is an important resource, estimated to contain approximately 114 million acre-feet of water under approximately 15,500 square miles of land surface. Several fresh water aquifers are present beneath the Basin ranging in depth from near the soil surface to 3,000 feet below ground. The Sacramento Valley Groundwater Basin is one of the several large categorical areas that constitute the Central Valley Groundwater Basin. The Sacramento Valley Groundwater Basin covers nearly 7,900 square miles. The Sacramento Valley Groundwater Basin is comprised of numerous sub-basins with hydrogeological and political delineations.

The North American Groundwater Subbasin (Subbasin), the aquifer system underlying the City of Lincoln, is one of 18 subbasins that comprise the Sacramento Valley Groundwater Basin. The Subbasin lies within portions of Sutter, Placer, and Sacramento Counties. The Subbasin is identified by the California Department of Water Resources (DWR) in Bulletin 118-2003 as Basin No. 5-21.64. The approximate total storage of the North American Subbasin is 4.9 million acre-feet of water, across a surface land area of approximately 351,000 acres. This Subbasin is the primary groundwater source for the City.

City Wells and Operations

The City maintains a network of wells that are used to augment water supplies to manage peak flows, provide emergency back up, and address drought conditions. The wells are interspersed throughout the City's water infrastructure system. Below in **Figure 3-1** is a map depicting the locations of the City's wells.

Figure 3-1 – Production Wells



The City currently has five (5) active production wells on-line and available for automatic operation through a SCADA system dedicated to the City water system. Selected characteristics of the 5 active wells is shown in Table 3-7 below.

Table 3-7 – Active Wells

Well Name	Design Capacity, gpm	Year Built/ Upgraded	Status
Well No. 2-Nicolaus Rd.	900	1984/1990/2015	Operational
Well No. 6-Westwood	800	2000	Operational
Well No. 7-Moore Rd.	1,100	2002	Operational
Well No. 8-Fiddymment	1,400	2004	Operational
Well No. 9-Nelson	2,300	2005	Operational

Groundwater quality from the City wells meets primary and secondary State standards and requires only on- site disinfection.

Well No. 2 – Nicolaus Road

Well No.2 received a significant upgrade in 2015. Upgrading was required due hydraulic changes in the City distribution system that required increasing the total dynamic head available from the well pump to match the increased system pressures in the area of the well.

The well was originally completed as a City well in 1984. Drilled by cable-tool methodology, a blank 14-inch casing was anchored at about 117 feet-below ground surface (bgs) and an open hole below to -285 bgs. When a severe sanding issue occurred in 1990, a well screen was installed below the blank casing, and the well equipped to pump about 650 gpm with an on-site back-up generator for emergency well operations. Until 2003 Well Nos. 2 & 4 exclusively served a portion of the City, through a 10,000 gallon hydro-pneumatic tank at each well site, with treated surface water available as an emergency backup supply. In 2003 the hydraulic grade at Well No. 2 was increased as valves were opened in the system to eliminate the separate well zone and allow the treated surface water supply form the City’s gravity storage tank to serve the former well zone with Well Nos. 2 & 4 taken offline as inactive until upgraded.

In 2015, Well No. 2 was upgraded with new equipment for automatic, online operation as a backup and peak management source of potable water in the City’s distribution system. Significant upgrades included well casing improvements, pumping plant replacement (100HP pump), and pump-to–waste facilities per State requirements.

Well No. 6 – Westwood Well

Well No. 6, or commonly referred to as the Westwood Well, was completed in 2000 as the first of three wells constructed by a developer on behalf of the City. Drilled by the

reverse-rotary method, the 16-inch well casing extends to 235 feet-bgs. The Westwood Well was the first of the City's last 4 wells to fully incorporate a standardized approach to production facility design and operation. The 125 HP submersible pump was housed in a concrete block building and discharging into a 10,000 hydro-pneumatic tank before entering the City's distribution system. The Westwood Well is fully automatic for on-line operation from the City SCADA system, and can accommodate temporary stand-by power in case of emergency.

Well No. 7 – Moore Road Well

Well No. 7, or commonly referred to as the Moore Road Well, was completed in 2002 as the second of three wells constructed by a developer on behalf of the City. Drilled by the reverse-rotary method, the 16-inch well casing extends to 300 feet-bgs. The Moore Road Well was the second of the City's last 4 wells to fully incorporate a standardized approach to production facility design and operation. The 150 HP vertical turbine pump was housed in a concrete block building and discharging into a 10,000 hydro-pneumatic tank before entering the City distribution system. The Moore Road Well is fully automatic for on-line operation from the City SCADA system, and can accommodate temporary stand-by power in case of emergency. The well pump motor has been repaired once since its initial installation.

Well No. 8 – Fiddymment Road Well “A”

Well No. 8, or commonly referred to as the Fiddymment Well, was completed in 2005 as the last of three wells constructed by a developer on behalf of the City. Located on City property near the City's Regional Wastewater Treatment Facility there was considerable caution taken by the State in approving the well for potable water production due to proximity of the City's nearby waste treatment and storm water retention ponds. Drilled by the reverse-rotary method, the 16-inch well casing extends to 330 feet-bgs. The Fiddymment Well was the third of the City's last 4 wells to fully incorporate a standardized approach to production facility design and operation. Due to the location, the 200 HP vertical turbine pump was installed outside of the concrete block building, discharging in to a 10,000 hydro-pneumatic tank before entering the City distribution system. The Fiddymment Well is fully automatic for on-line operation from the City SCADA system, and can accommodate temporary stand-by power in case of emergency. Since commencement of operation, there have been no problems with any biological testing of the groundwater pumped from the Fiddymment Well.

Well No. 9 – Moore-Nelson Well

Well No. 9, or commonly referred to as the Nelson Well, was completed in 2005 and the first well constructed by the City since 1990. Located just east of the Fiddymment Well, on City property near the Regional Wastewater Treatment Facility there was considerable caution taken by the State in approving the well for potable water production due to

proximity to the City's nearby waste treatment and storm water retention ponds. Drilled by the reverse-rotary method, the 16-inch well casing extends to 340 feet-bgs. The Nelson Well was the final of the City's last 4 wells to fully incorporate a standardized approach to production facility design and operation. Due to the location, the 300 HP vertical turbine pump was installed outside of the concrete block building. The Nelson Well is fully automatic for on-line operation from the City SCADA system, and can accommodate temporary stand-by power in case of emergency. Since commencement of operation, there have been no problems with any biological testing of the groundwater pumped from the Nelson Well. The 300-HP vertical turbine motor and pump assembly was replaced with a submersible assembly in 2014.

The City's wells are used to supplement supply and manage operational pressures in the lower pressure zones. Availability of surface water supplies from PCWA and NID will continue to reduce the City's reliance on its groundwater assets. As urbanization occurs, groundwater pumping for municipal and industrial demands will increase but will likely be more than offset by the reduction in groundwater pumping by private agricultural users. **Tables 3-8 and 3-9** below show the City's historic groundwater pumping as well as its projected groundwater pumping into the future.

Table 3-8 - Historic Groundwater Pumping

Acre Feet							
2008	2009	2010	2011	2012	2013	2014	2015
1,085	836	962	2,561	2,722	1,066	691	707

Table 3-9 - Projected Groundwater Pumping

Acre-feet				
2020	2025	2030	2035	2040
1,615	2,127	2,905	3,301	3,514

The City currently limits groundwater use during normal years to 10 percent of its build-out demand – which is anticipated to be approximately 4,000 acre-feet. To maximize the benefits of this groundwater supply it is critical that the wells are used as a peaking source only in the summer months with daily production increasing with the daily demands. This type of operation can help offset the peak day demands on the surface water supply and help manage pipe velocities in peak hour scenarios.

The current groundwater pumping system has a combined capacity of 8.5 mgd or about 75% of the current maximum day demand which is sufficient as an emergency supply for all but the hottest summer irrigation days. The total capacity of the system on any given day will vary depending on the number of wells in operational condition.

Groundwater Governance

In 2007, the City of Lincoln adopted the Western Placer County Groundwater Management Plan (WPCGMP).⁴¹ The WPCGMP is designed to assist the City of Roseville, the City of Lincoln, Placer County Water Agency (PCWA), and the California American Water Company (CAW) in an effort to maintain a safe, sustainable and high-quality groundwater resource within a zone of the North American Groundwater Subbasin.⁴² The objective of the WPCGMP is to maintain groundwater resources to meet backup, emergency, and peak demands without adversely affecting other groundwater uses within the WPCGMP area. Moreover, the purpose of the WPCGMP is to provide a framework to coordinate groundwater management activities through a set of basin management objectives and specific implementation actions.⁴³ The “WPCGMP Area,” which is located in southwestern Placer County, is shown in **Figure 3-2**.⁴⁴

⁴¹ Available at

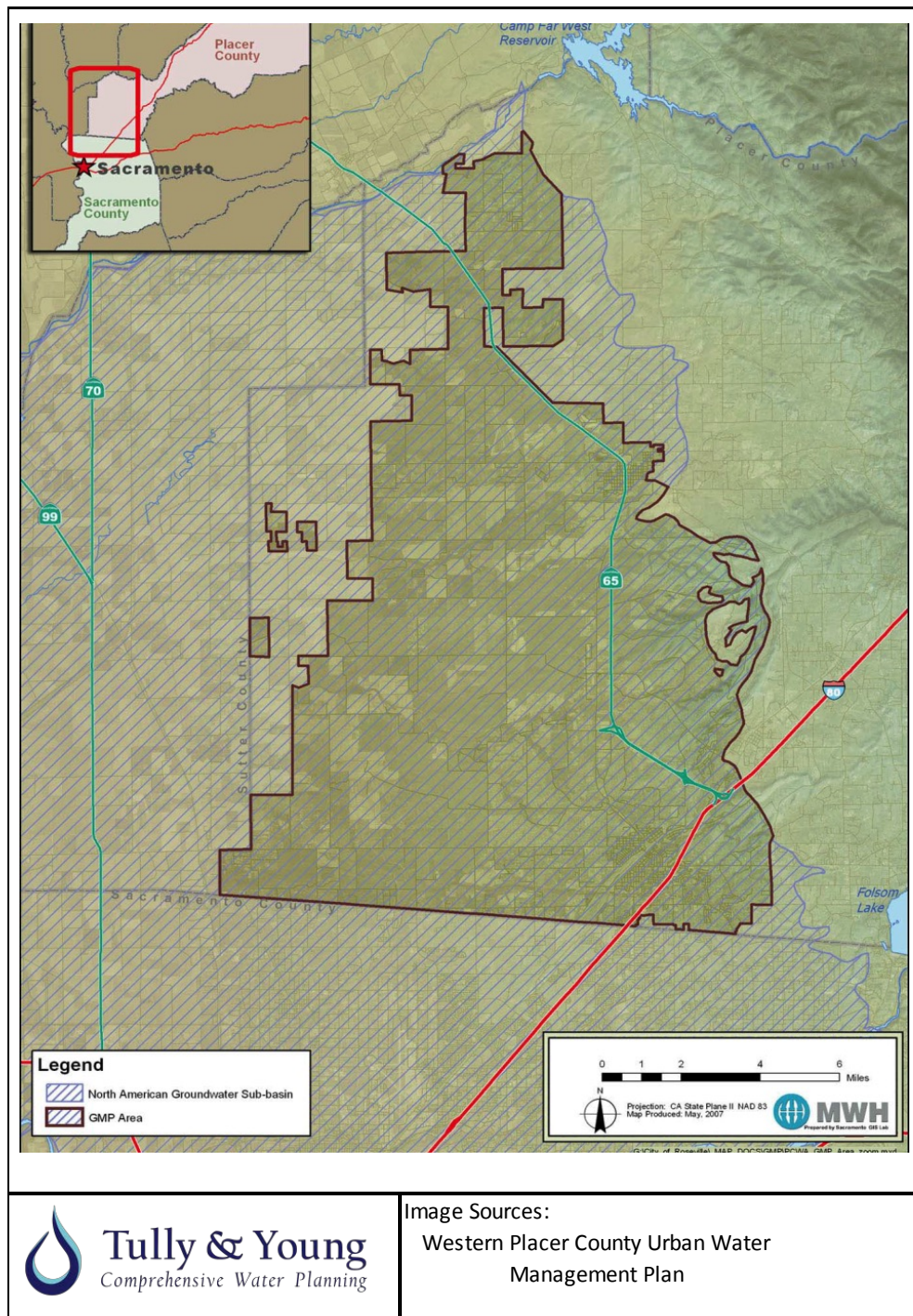
https://www.pcwa.net/files/docs/enviro/WPCGMP_Groundwater_Management_Plan_07.pdf

⁴² WPCGMP, p. ES-1.

⁴³ WPCGMP, p. 1-3.

⁴⁴ Figure 3-1 appears as Figure 1-1 in the WPCGMP.

Figure 3-2 – WPCGMP Boundary



The WPCGMP discusses historical groundwater elevation trends by analyzing 13 hydrographs for wells located within and adjacent to the WPCGMP Area. (See WPCGMP, Section 2.1.5 and Figure 2-5.) The three wells analyzed in the WPCGMP located at the southern end of the WPCGMP Area show stabilized groundwater levels for the last 20-30 years starting in the mid-1980s and mid-1990s after 40-50 year declining

trends.⁴⁵ Groundwater elevations are improving in and around the City of Lincoln. Further west of Lincoln, near the Placer-Sutter County border, groundwater elevations have seen slow declines, especially during the last four drought years (2012-2015). Since 2007, groundwater levels throughout WPCGMP area have remained relatively stable.

The Sustainable Groundwater Management Act (SGMA) may alter the City's existing groundwater management activities as envisioned in the WPCGMP effort. The SGMA requires establishing a Groundwater Sustainability Agency (GSA) and a Groundwater Sustainability Plan (GSP) by July 2017 and July 2022, respectively. Regulations related to both GSA and GSP formation have been developed. The Sacramento Groundwater Authority, a Joint Powers Authority with a common interest in the North American Groundwater Subbasin, has established itself as a GSA. Exactly how the WPCGMP interests will integrate with SGA in both entities basin planning is yet to be defined. Nevertheless, once a GSA is formed, the participating agencies will be required to develop a GMP that coordinates management with all North American Groundwater Subbasin water users and stakeholders. This GMP may mimic the WPCGMP fundamental analyses but it is too early to tell if those analyses will meet the states' more stringent GMP regulations.

3.3.6 PCWA Raw Water

The City receives PCWA raw water for irrigation purposes through the Caperton Canal. This delivery manifests through a raw water contract paid for by the City of Lincoln. The PCWA raw water offsets potential potable water use within the City of Lincoln.

3.3.7 NID Raw Water

Areas within the City and its Sphere of Influence receive NID raw water for irrigation purposes. This includes Turkey Creek Golf Course area as well as Lincoln Crossing. The water deliveries and payment obligations are not controlled by the City. The raw water offsets potential potable water use within the City of Lincoln.

3.4 Recycled Water

Lincoln's Wastewater Treatment and Reclamation Facility (WWTRF) became operational in 2004 for the purpose of treating wastewater generated within the City. The WWTRF is capable of producing tertiary treated recycled water that meets DHS requirements in Title 22 for unrestricted reuse. The 2008 WWTRF Expansion Plan contemplates the expansion of the capacity of the WWTRF to accommodate an increase in flow as the City of Lincoln's treated water demand increases in the coming years.

⁴⁵ See discussion of Wells 10N05E08L002, 10N06E10C001M, and 10N05E12D001M in WPCGMP, p. 2-8.

While plant capacity will dictate the potential recycled water supply from the WWTRF, treated water demand and the wastewater generated from such demand will drive the quantity of water available for reuse after treatment. Because it is not certain at this time whether the City of Lincoln will partner with Placer County and/or the City of Auburn, for use of Recycled Water, the recycled water availability analysis that follows assumes only the WWTRF is only treating wastewater generated by the City of Lincoln's treated water service customers is the available reclaimed supply for Lincoln.

The City of Lincoln has identified existing and potential recycled water users.⁴⁶ The City of Lincoln identifies three recycled water use categories, including Agricultural Irrigation (i.e., crops), Landscape Irrigation (i.e., parks, golf courses, road medians, highway landscaping), and Industrial/Commercial (i.e., cooling, washing, and other process uses) uses. The City's Recycled Water Master Plan indicates that significant infrastructure will be constructed throughout the City in order to deliver treated wastewater to end-users. Since 2000, the City has been installing "purple pipe" within the new developments that will use the recycled water produced by the City. Uses for recycled water include irrigation of parks, school grounds, and median landscapes (including along the Highway 65 Bypass right of way) as well as industrial cooling and process water for a few of the City's primary industries. Recycled water may be available to meet uses in various new developments.

The current design daily average dry weather flow capacity of the WWTRF is 4.2 MGD. The City is in the later stages of completing a WWTRF expansion and upgrade to increase the design average dry weather flow from 4.2 MGD up to 5.9 MGD to accommodate regionalization with the Placer County Sewer Maintenance District 1 (SMD#1) Wastewater Treatment Plant. The City's Master Permit allows for an increase in the permitted average dry weather flow up to 8.4 MGD to accommodate growth within the City's service area and additional regionalization projects.

Recycled water from the WWTRF is currently utilized for agricultural purposes and discharged into Auburn Ravine. The anticipated recycled water uses within the City has been projected to account for as much as 6,822 acre-feet per year of the anticipated build-out water demand.

⁴⁶ City of Lincoln, Technical Memorandum 1, Recycled Water Users Description and Phasing, April 16, 2007 (Lincoln Recycled Water Tech. Memo 1).

3.5 Desalinization

The City is not located near any ocean or salt water. Therefore, this option is not being considered or pursued by the City.

3.6 Water Transfer Opportunities

The City has opportunities to acquire water through water transfers and make water available for water transfers. Acquiring water through water transfers would require the City to obtain permission from either NID or PCWA in order to use those conveyance facilities to recover the water. And, although NID or PCWA may be willing to grant such permission in very unusual circumstances, those two entities have ample supplies to meet the City's needs into the foreseeable future and obtain revenue for water service.

The City is also able to make water available for water transfers. Because of the City's access to groundwater assets, the City may be able to forego NID or PCWA-derived surface water supplies under certain conditions in order to make surface water supplies available to other users. Under the PCWA 2012 contract, there is a reference that PCWA may ask the City to use its groundwater assets in times of shortage. Certainly, in critically dry conditions, the City may be able to direct the water supplies under the 2012 contract to other regional water users. Any transfer of surface water assets would require regional cooperation among the wholesale water agencies.

The City also has recycled water supplies that are available for transfer. The City currently transfers those supplies to regional agricultural users for irrigation purposes in accordance with the City's water discharge regulatory requirements. As more recycled water supplies become available, the City may engage in more recycled water deliveries to offset groundwater pumping or use of other sources of water. The City may seek financial compensation for these deliveries or potentially acquire rights to foregone surface or groundwater supplies that were replaced by the recycled water deliveries.

The City also discharges excess recycled water supplies to Auburn Ravine as required under its permits. The City anticipates taking actions to claim those supplies and dedicate them to a specific beneficial use. As such, the City may consider assessing the volume of discharged water into the Auburn Ravine and whether that water is of sufficient quantity as to be used for beneficial purposes or sold to third party interests.

3.7 Water Reliability Assessment

The City of Lincoln has reliable and redundant water supplies. Specifically, the City has surface water supplies under its contractual relationships with PCWA and NID that are derived from two vast wet watersheds – the American River system and the Yuba-Bear system. Both PCWA and NID have planned to serve their respective service areas within the City's existing boundary and Sphere of Influence – calculating the City's future

demands into their planning documents, including their 2015 UWMPs. In addition, the City has access to groundwater throughout its service area as well as recycled and raw water to meet non-potable demands. Together this portfolio of water supplies are robust and provide ample security for the City's long term water planning. Importantly, as described in **Chapter 7**, the City will only access and use water supplies that it needs in any given year. For example, even though PCWA has allocated approximately 37,000 acre-feet of water to meet the City of Lincoln's needs, the City, in any given year, will only access and pay for the volume of water it needs to meet its existing demands. As such, the City will not be taking excessive water assets through its system even though it may have the ability to call on those assets as needed.

3.7.1 Normal Year Water Supplies

The City has access to significant normal year supplies from PCWA and NID. Both PCWA and NID characterize the water supplies available to the City based upon the City's overall demand. PCWA has assessed the total Lincoln demand for PCWA water to be as high as 37,000 acre-feet at build-out.⁴⁷ And although this volume exceeds the demand in the PCWA service area within the City and its SOI, the City may expand water uses in existing areas, expand its SOI, or move some PCWA water into the NID service area during certain instances in the future. Accordingly, it is plausible that PCWA could serve the City with 37,000 acre-feet of water in normal years in the future.

The NID service area within the City could receive deliveries as high as 12,000 acre-feet of water to meet its build-out demands. These treated water supplies may also include replacing raw water deliveries in the City's SOI, if necessary. As such, NID is prepared to deliver as much as 12,000 acre-feet of water to the City in normal years. The City would also have access to recycled water supplies to meet demands throughout the City and the SOI. These recycled water supplies would be used to offset either raw or treated water deliveries – resulting in a reduced demand on those PCWA and NID water assets. Moreover, as demands increase, recycled water supplies also increase. Last, the City has access to groundwater through its 5 wells and will likely expand its well capacity in the future in order to meet its 10 percent overall supply policy. Accordingly, **Table 3-10** below shows both the potential water supplies available to the City in normal years as well as anticipated supply acquired from all supply sources.

⁴⁷ PCWA 2015 UWMP Projections for the City of Lincoln increase from 13,239 acre-feet in 2020 to 30,260 acre-feet by 2045. Total deliveries by PCWA will continue to increase beyond 2045 until the City reaches build-out.

Table 3-10 - Normal Year Water Supplies

Supply Source (values in acre-feet/yr)	2020	2025	2030	2035	2040
PCWA Supply	13,239	15,421	18,335	21,187	25,533
NID Supply	12,000	12,000	12,000	12,000	12,000
Recycled Water Supply	3,300	3,748	4,381	5,015	6,063
Groundwater	2,854	3,117	3,472	3,820	4,360
Total Supply	31,393	34,286	38,188	42,022	47,955
Anticipated Supply Acquired	11,192	12,710	14,859	17,007	20,561

3.7.2 Single Dry Year Water Supplies

Although both PCWA and NID have robust direct diversion rights and water storage facilities, water shortages may still occur. As such, the City may be subject to reductions in supplies during a single dry year. PCWA has indicated that supplies could be reduced by 25 percent in dry years.⁴⁸ NID, as demonstrated in 2015, may not reduce supplies at all during dry years.⁴⁹ Even in dry years, indoor demands remain relatively constant. And groundwater supplies may increase in order to augment surface supply deficits. However, for this explanatory table, we have kept the groundwater supplies at 10 percent of the total supply available reflecting reductions in surface water supply deliveries. As such, **Table 3-11** below shows the potential single dry year reliability for the City of Lincoln's water supplies as well as anticipated supply acquired from all supply sources.

Table 3-11 - Single Dry Year Water Supplies

Supply Source (values in acre-feet/yr)	2020	2025	2030	2035	2040
PCWA Supply	9,929	11,566	13,751	15,890	19,150
NID Supply	12,000	12,000	12,000	12,000	12,000
Recycled Water Supply	3,300	3,748	4,381	5,015	6,063
Groundwater	2,523	2,731	3,013	3,290	3,721
Total Supply	27,752	30,045	33,146	36,195	40,934
Anticipated Supply Acquired	11,751	13,346	15,453	17,517	21,178

⁴⁸ Placer County Water Agency 2015 Urban Water Management Plan at 7-2.

⁴⁹ All reduced water deliveries in NID's service area resulted from SWRCB's mandated water conservation requirements rather than a lack of supply in NID's system.

3.7.3 Multiple Dry Year Water Supplies

The City may be subject to reductions in supplies during multiple dry years. PCWA has indicated that supplies could be reduced by only 5 percent in multiple dry years.⁵⁰ NID, as demonstrated in 2015, may not reduce supplies at all during dry years. Even in dry years, indoor demands remain relatively constant. And groundwater supplies may increase in order to augment surface supply deficits. However, for this explanatory table, we have kept the groundwater supplies at 10 percent of the normal year supply available. As such, **Table 3-12** below shows the multiple dry year reliability for the City of Lincoln's water supplies as well as anticipated supply acquired from all supply sources. Note that the anticipated supply acquired is reduced in years 2 and 3 as end-users demands are reduced through conservation efforts.

Table 3-12 - Multi-Dry Year Water Supplies

Supply Source (values in acre-feet/yr)	2020	2025	2030	2035	2040
Multi-dry Year 1					
PCWA Supply	12,577	14,650	17,418	20,128	24,256
NID Supply	12,000	12,000	12,000	12,000	12,000
Recycled Water Supply	3,300	3,748	4,381	5,015	6,063
Groundwater	2,788	3,040	3,380	3,714	4,232
Total Supply	30,665	33,437	37,180	40,857	46,551
Anticipated Supply Acquired	11,751	13,346	15,453	17,517	21,178
Multi-dry Year 2					
PCWA Supply	12,577	14,650	17,418	20,128	24,256
NID Supply	12,000	12,000	12,000	12,000	12,000
Recycled Water Supply	3,300	3,748	4,381	5,015	6,063
Groundwater	2,788	3,040	3,380	3,714	4,232
Total Supply	30,665	33,437	37,180	40,857	46,551
Anticipated Supply Acquired	10,576	12,011	13,908	15,766	19,060
Multi-dry Year 3					
PCWA Supply	12,577	14,650	17,418	20,128	24,256
NID Supply	12,000	12,000	12,000	12,000	12,000
Recycled Water Supply	3,300	3,748	4,381	5,015	6,063
Groundwater	2,788	3,040	3,380	3,714	4,232
Total Supply	30,665	33,437	37,180	40,857	46,551
Anticipated Supply Acquired	9,401	10,677	12,363	14,014	16,942

⁵⁰ Placer County Water Agency 2015 Urban Water Management Plan at 7-3.

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CHAPTER 4. WATER DEMAND CONDITIONS

Understanding water demand characteristics is essential to enable the City of Lincoln to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This section characterizes the City's current retail customer demands as well as forecast demands over the next few decades. Demand characteristics, such as how demands vary among different land use classifications and under differing hydrologic conditions, may also change over time. This section is organized as follows:

- ◆ Review and refinement of the *2020 Urban Water Use Target* – This subsection presents the review and refinement of 2015 and 2020 water use targets as allowed under CWC §10608.20(g).⁵¹
- ◆ Compliance with *Interim 2015 Urban Water Use Target* – This subsection documents the derivation of the 2015 GPCD value and comparison to the 2015 interim target.
- ◆ Historic and Current Water Demands – This subsection presents data reflecting the historic and current water demand conditions for residential and non-residential customers in the City.
- ◆ Future Water Demands – This subsection presents the derivation of future demands for potable water within the City's service area, including land-use classifications, unit demand factors, and estimation of non-revenue water.
- ◆ Summary of Water Demands – This subsection presents a summary of the projected current and future water demands in five-year increments.

4.1 Review and Refinement of GPCD Targets

As detailed in the City's 2010 UWMP, population, residential connections, and water production data were used to generate a gallon per capita day (GPCD) baseline. From this GPCD baseline, the City assessed and determined a *2020 Urban Water Use Target* and an *Interim 2015 Urban Water Use Target*. Based upon data available at the 2010 UWMP public hearing these values were determined to be 197 and 221, respectively, as presented in the 2010 UWMP.⁵²

⁵¹ 10608.20(g): *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

⁵² City of Lincoln 2010 UWMP, p. 4-18 (available at: <http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Lincoln,%20City%20of/Lincoln%20UWMP%20Final.pdf>)

According to the DWR Guidebook, a retail water purveyor who did not use actual 2010 Census data must re-calculate its baseline using the available 2010 Census data.⁵³ For the City's 2010 UWMP, the 2010 Census data was not fully available but a 2010 estimate was available from the Department of Finance (DOF).⁵⁴ Thus, the City must recalculate its baseline GPCD and re-establish its target and interim-target values with the available 2010 Census data.⁵⁵

Given the City's political boundary and the City's water service boundary significantly coincide, DOF population numbers are the appropriate choice for a DWR approved population source. New population values divided into the previously determined gross water values (as documented in the 2010 UWMP) provided revised GPCD values for this period. The 2010 Census resulted in a revision to the City's previously determined baseline data. **Table 4-1** provides a comparison of the yearly population and GPCD estimates from the 2010 UWMP and as revised using 2010 Census data and the DWR population tool.⁵⁶

Using the revised annual GPCDs for the City's baseline period, new values were calculated for the six 10-year time periods ending no earlier than December 31, 2004 and no later than December 31, 2009. The comparative results are shown in **Table 4-2**. As expected, the use of 2010 Census data had a minor effect on the estimated baseline values, and the resulting 2015 Interim GPCD Target and 2020 GPCD Target.

Pursuant to CWC 10608.20(g) the City may choose to select a different method for calculating its 2020 GPCD target. Upon review of the analysis in the 2010 UWMP that resulted in the choice of Method 1, the City finds no reason to vary from the prior method choice. Thus, the City is officially using Method 1 to establish its 2020 GPCD target. However, to accurately reflect the use of the 2010 Census data, the City will modify its 2020 GPCD Target to be 193 gallons per capita per day (see **Table 4-2**).

⁵³ "If an agency did not use 2010 U.S. Census data for its baseline population calculations in the 2010 UWMP (the full census data set was not available until 2012) the agency must re-calculate its baseline population for the 2015 UWMPs using 2000 and 2010 Census data. This may affect the baseline and target GPCD values calculated in the 2010 UWMP, which must be modified accordingly in the 2015 UWMP." (2015 Urban Water Management Plans: Guidebook for Urban Suppliers, DWR, January 2016, p. 5-8)

⁵⁴ Even using the Department of Finance numbers, the baseline period must be re-analyzed to account for the impacts of the 2010 Census. 2015 DWR UWMP Guidebook section 5.2.2

⁵⁵ According to CWC Section 10608.20(g), the City may also re-assess the methodology chosen to determine its 2015 and 2020 GPCD targets and update these targets, even if the 2010 population data was appropriate.

⁵⁶ The DWR population tool requires a login and password, but is available here:

https://wuedata.water.ca.gov/secure/login_auth.asp?msg=inactivity&referer=%2Fsecure%2FDefault.asp?

Table 4-1 – Revised Annual GPCD using 2010 Census Data

Year	From 2010 UWMP			For 2015 UWMP	
	Gross Water Use	Population	GPCD	Revised Population	Revised GPCD
1995	1,751	8,333	188	8,303	188
1996	1,854	8,579	193	8,549	194
1997	2,162	8,901	217	8,871	218
1998	1,854	9,053	183	9,023	183
1999	2,252	9,635	209	9,605	209
2000	2,610	11,235	207	11,205	208
2001	3,734	13,659	244	13,716	243
2002	4,776	16,886	253	17,089	250
2003	5,388	20,035	240	20,387	236
2004	7,541	23,480	287	24,011	280
2005	8,343	27,433	272	28,083	265
2006	9,376	33,619	249	34,342	244
2007	10,320	37,455	246	38,360	240
2008	10,522	39,636	237	40,726	231
2009	10,155	40,532	224	41,787	217
2010	9,203	41,141	200	42,819	192

Table 4-2 – Comparison of baseline and target values

Baseline Period	Baseline Values		2015 Target		2020 Target	
	Original	Revised	Original	Revised	Original	Revised
1995-2004	222	221	200	199	178	177
1996-2005	230	229	207	206	184	183
1997-2006	236	234	212	210	189	187
1998-2007	239	236	215	212	191	189
1999-2008	244	241	220	217	195	192
2000-2009	246	241	221	217	197	193
2001-2010	245	240	221	216	196	192

4.2 Compliance with 2015 Interim Target

Pursuant to CWC Section 10608.40, the City is to report to DWR on its progress in meeting its urban water use targets as part of its 2015 UWMP. As part of the progress reports, the City should include its “compliance daily per capita water use” (Compliance Value), which is the gross water use during the final year of the reporting period, reported in gallons per capita per day.⁵⁷ Documentation of the Compliance Value must include the basis for determining the estimates, including references to supporting data.

⁵⁷ CWC § 10608.12(e).

Furthermore, pursuant to CWC Section 10608.24(a), the City must demonstrate that it has met its 2015 Interim GPCD Target as of December 31, 2015 through its calculation of its 2015 Compliance Value.

Extending the population analysis that was revised during the reassessment of the baseline GPCD, the City is able to calculate its 2015 Compliance Value. **Table 4-3** presents the extended population calculation for 2011 through 2015, the associated gross water use in each year, and the resulting annual GPCD. As shown in the table, the City's 2015 Compliance Value is 149 gallons per capita per day, which is significantly below the 2015 Interim GPCD value of 217.

Though the 2015 Compliance Value seems impressive, the City does not believe it represents the actual progress toward its 2020 GPCD Target conditions due to two factors: (1) weather conditions in 2015, and (2) mandatory conservation requirements imposed by the State Water Resources Control Board. While normalizing for weather is recognized and suggested in statute⁵⁸, with a tool available from DWR to perform the calculation, the State mandated conservation likely had a greater downward affect on the 2015 Compliance Value.

Table 4-3 – Annual GPCD for 2011 through 2015

Year	Population	Gross Water Use (af/yr)	GPCD
2010	42,819	9,203	192
2011	43,142	9,481	196
2012	43,915	10,091	205
2013	44,336	10,858	219
2014	45,259	8,948	177
2015	45,837	7,628	149

Although adjustments for weather are allowed, they are not required.⁵⁹ Because the City's 2015 Compliance Value demonstrates that the City is in compliance with the statutes, it has elected to not adjust the 2015 Compliance Value for weather. However, it has chosen to adjust the value to understand what 2015 GPCD conditions may have been absent the State conservation mandate so that it can appropriately assess progress toward its 2020 Target GPCD.

One option for the City to understand its progress toward the 2020 Target GPCD is to look at the most recent "average" year, which would be 2013. In 2013 there were no mandatory conservation measures and weather was not significantly different than average conditions (though it was the beginning of the current drought cycled). Even

⁵⁸ CWC Section 10608.24(d)(1)(A)

⁵⁹ CWC Section 10608.24(d)(2)

without these factors the GPCD in 2013 was 219 gpcd, close to the revised 2015 Target GPCD value of 217 (see **Table 4-2**).

Another option is to adjust the 2015 GPCD value to remove the conservation achieved by the City during its efforts to comply with the State's mandate. The State had mandated the City meet a 32 percent conservation goal between June 2015 and February 2016. Through December 2015, the City successfully achieved a 33.3 percent cumulative savings (compared to 2013 conditions – which was the State's baseline).⁶⁰ There are multiple methods to normalize the 2015 water use for the months of June through December. Using a few simple multiplier approaches the actual gross water production in 2015 of 7,628 acre-feet would increase to between 9,100 and 9,700 acre-feet. For illustrative purposes, using both of these values, the 2015 GPCD would adjust from 149 gpcd to between 178 and 188 gpcd. This normalized value is still below the 2015 Interim GPCD Target, but also still below the 2020 GPCD Target.

From this information, the City concludes that it is on track to achieve its 2020 GPCD Target when it reports the 2020 Compliance Value in its next UWMP update. The City recognizes that a primary factor in this early success has been an ongoing customer efficiency programs.

4.3 Current and Forecast Water Demands

Based on available records for water production, water sales and deliveries, the City's water demands for the past five years were previously presented in **Table 4-3**. As demonstrated by the accompanying population values in the Table, the City has experienced about a 1.5 percent growth rate since the 2010 UWMP. This rate is reduced from the growth experienced in the prior decade. But, as described in **Chapter 2**, the City anticipates significant growth into the future.

Forecasting future demand requires several considerations: the future water use habits of existing customers that will lower their existing use, the land use plans demonstrating types of anticipated growth, and the various laws and regulations that govern future water use factors such as fixtures, appliances, and landscaping.

4.3.1 Existing Customers

As described in **Chapter 2**, the City serves a growing area of Placer County with a variety of residential and non-residential customers with varying uses. Existing customers are generally categorized in fairly broad land-use classifications: single family

⁶⁰Based on report from the SWRCB available at:
http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2016feb/suppliercompliance_020216.pdf

residential, multi-family residential, commercial, industrial, public, and parks and landscape.

With account numbers and meter data, the existing unit demand factors for each can be determined. This information provides a baseline for estimating the future demands of existing customers. **Table 4-4** provides the baseline demand factors for each land use category using 2013 account and meter data. The City believes 2013 was more representative of average conditions, and determined the data would be skewed if 2014 or 2015 customer use data were used for baseline conditions. This decision is confirmed further when reviewing the GPCD values in **Table 4-3**.

Existing customers' future unit demand factors are assumed to change mostly from demand drivers such as general homeowner fixture replacements and upgrades, increased awareness and management by homeowners of landscape irrigation scheduling, the City's conservation awareness and incentive programs, and other factors affecting a general increased awareness of water conservation. The future unit demand factors for existing customers reflect a reduction from the current value for residential customers resulting from minor conservation reductions. This reduction is reasonable as it reflects expected benefits of on-going City and customer conservation efforts, coupled with the use of 2013 for baseline conditions.

Table 4-4 – Existing Customer Characteristics

Land-class	Current Accounts	Existing Customers		Notes
		Current Demand Factors (af/account)	Future Demand Factors (af/account)	
Multi-Family	1,873	0.30	0.25	MF represented as units rather than accounts
Single Family	16,486	0.40	0.35	
Commercial	247	0.99	0.99	
Industrial	7	2.15	2.15	
Public	23	2.57	2.57	
Parks/Landscapes	186	3.73	3.73	

4.3.2 Future Customers

As discussed in **Section 2.1.2**, City's service area is growing, having many new areas identified for future annexation into the City's identified sphere for influence. The expected growth will occur as a result of large development projects that will expand the City limits and more than triple the number of housing units by build-out.

There are several factors that affect the development of future unit water demand, which in turn affect the forecasted water demand for future customers. These range from state mandates to changes in the types of housing products being offered. These are incorporated into the determination of future unit water demand factors, discussed later in this chapter. Characteristics of the most important factors are described below.

4.3.2.1 Factors Affecting Future Water Demands

These following factors are generally recognized to result in lower per unit demand factors for future residential and non-residential customers. A brief discussion of each follows:

Water Conservation Objectives:

On November 10, 2009, Governor Arnold Schwarzenegger signed SBX7-7, which required each urban water supplier to reduce its per-capita water use by 2020, with a statewide goal of achieving a 20-percent reduction by 2020.⁶¹ As discussed previously, the City has established a 2020 Target GPCD in response to this requirement.

Achieving the City's 2020 conservation target will require the City to continue its on-going conservation efforts. But, as illustrated by the compliance analysis previously discussed, the City has already achieved its goal. New customers will likely further reduce the City's annual GPCD since the factors below were designed to lower use.

Indoor Infrastructure Requirements

In January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") that requires the installation of water-efficient indoor infrastructure for all new projects beginning after January 1, 2011. The Cal Green Code was revised in 2013 with the revisions taking effect on January 1, 2014; however these revisions do not have substantial implications to the water use already contemplated by the 2010 Cal Green Code.⁶² The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed building or structure.

All new developments must satisfy the indoor water use standards directed by the CAL Green Code, which essentially require new buildings and structures to reduce overall potable water use by 20 percent. Expected future customers will satisfy the standards through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures as well as Energy Star and California Energy Commission-approved appliances.

⁶¹ California Water Code § 10608.20

⁶² "The 2010 CAL Green Code was evaluated for updates during the 2012 Triennial Code Adoption Cycle. HCD evaluated stakeholder input, changes in technology, implementation of sustainable building goals in California, and changes in statutory requirements. As such, the scope of the CAL Green Code was increased to include both low-rise and high-residential structures, additions and alterations." *Guide to the 2013 California Green Building Standards Code (Residential)*, California Department of Housing and Community Development, 2013.

California Model Water Efficient Landscape Ordinance

The Water Conservation in Landscaping Act was enacted in 2006, requiring the Department of Water Resources to update the Model Water Efficient Landscape Ordinance (MWELO).⁶³ In 2009, the Office of Administrative Law (OAL) approved the updated MWELO, which required a retail water supplier or a county to adopt the provisions of the MWELO by January 1, 2010, or enact its own provisions equal to or more restrictive than the MWELO provisions.⁶⁴

In response to the Governor's executive order dated April 1, 2015, (EO B-29-15), DWR updated the MWELO again and the California Water Commission approved the revised MWELO on July 15, 2015. The changes include a reduction to 55 percent for the maximum amount of water that may be applied to a landscape for residential projects, which reduces the landscape area that can be planted with high water use plants, such as turf. The MWELO applies to new construction with a landscape area greater than 500 square feet (the prior MWELO applied to landscapes greater than 2,500 sf).⁶⁵ For residential projects, the coverage of high water use plants is reduced to 25 percent of the landscaped area (down from 33 percent).

It is difficult to predict the ultimate impact of the MWELO requirements on future water demand. While the requirement is for development of a landscape design plan that uses plants and features that are estimated to use no more than 55 percent of ETo, some provision must be made for the inherent tendency to overwater even with irrigation controllers installed, piecemeal changes in landscape design, reductions in irrigation efficiency through product use, and limited resources for enforcement in the absence of dedicated irrigation meters.

4.3.2.2 Future Unit Demand Factors

When considering the various factors discussed above, coupled with a review of current customer use characteristics, the City has established the demand factors presented in **Table 4-5** for estimating future customer demands.

4.3.3 Demand Forecast Summary

Water demand projections within the City's service area reflect the combination of continued conservation by existing customers and the addition of new customers over the

⁶³ Gov. Code §§ 65591-65599

⁶⁴ California Code of Regulations (CCR), Tit. 23, Div. 2, Ch. 27, Sec. 492.4. The MWELO provides the local agency discretion to calculate the landscape water budget assuming a portion of landscape demand is met by precipitation, which would further reduce the outdoor water budget.

⁶⁵ CCR Tit. 23, Div. 2, Ch. 27, Sec. 490.1.

planning horizon. **Table 4-6** provides the summation of this analysis and the resulting expected demands for each 5-year planning horizon.

Table 4-5 – Future Customer Accounts and Demand Factors

Land-class	New Connections (cumulative)					Future Demand Factors
	2020	2025	2030	2035	2040	
Multi-Family	390	1,152	2,005	3,056	4,060	0.21
Single Family	2,520	4,980	8,297	12,120	17,279	0.46
Commercial	128	270	490	567	904	0.99
Industrial	0	0	0	0	380	2.15
Public	58	76	157	157	174	2.57
Parks/Landscapes	468	563	669	726	786	3.73

Table 4-6 – Projected Water Demands

Land-class		Forecast Demand (af/yr)				
		2020	2025	2030	2035	2040
Multi-Family	Existing	562	548	534	520	506
	Future	82	242	421	642	853
	Subtotal	644	790	955	1,162	1,358
Single Family	Existing	6,594	6,430	6,265	6,100	5,935
	Future	1,159	2,291	3,817	5,575	7,948
	Subtotal	7,754	8,720	10,081	11,675	13,883
Commercial	Existing	245	245	245	245	245
	Future	129	271	491	568	905
	Subtotal	373	515	736	813	1,150
Industrial	Existing	15	15	15	15	15
	Future	2	2	2	2	382
	Subtotal	17	17	17	17	397
Public	Existing	59	59	59	59	59
	Future	60	79	159	159	176
	Subtotal	119	138	218	218	235
Parks/ Landscape	Existing	694	694	694	694	694
	Future	472	566	673	729	789
	Subtotal	1,166	1,260	1,367	1,423	1,483
Subtotal		10,074	11,440	13,374	15,308	18,507
Unaccounted water (at 10%)		1,118	1,270	1,485	1,699	2,054
Total		11,192	12,710	14,859	17,007	20,561

4.3.4 Distribution System Water Losses

The demand factors presented earlier in this chapter represent the demand for water at each customer location. To fully represent the demand, distribution system losses must also be included. Often, non-revenue water represents water that is lost due to system leaks, fire protection, construction water, unauthorized connections and inaccurate meters. Essentially, this is the water that delivered to the City's main storage tanks or pumped by City wells that does not make it to the customer – either as a real loss or an apparent loss (e.g. such as may result when a customer meter under reports actual use).

In most instances, the predominant source of distribution system losses is from leaks that inevitably exist throughout the many miles of pipes and fitting that bring water to the City's customers.

Pursuant to CWC 10631(e)(3)(B), the City must quantify and report the distribution system loss for 2015 using methodology developed by the American Water Works Association (AWWA) and provided as a worksheet through DWR. Using the available worksheet, the City calculated a loss equal to 10.8 percent of the water supplied into the distribution system. Specifically, the non-revenue water, or the water losses plus the unbilled usages, amount to 10.8 percent. The AWWA worksheets are included as **Appendix A-4**.

For purposes of estimating future demand from new connections, the distribution system loss is assumed to be 10 percent to reflect on-going City programs to address meter inaccuracies, and find and fix identified system leaks.⁶⁶

4.3.5 Low Income Water Demands

CWC Section 10631.1 requires water suppliers to include a projection of water use by lower income households as defined by Health and Safety Code Section 50097.5. The housing element of the Placer County General Plan provides the income distribution used for this analysis.⁶⁷ This housing element, adopted in November 2013, uses data from U.S. Census Bureau 2005-2009 American Community Survey. The income limits for “lower income” come from U.S. Department of Housing and Urban Development's 2009 income guidelines.⁶⁸ In 2010, the median household income for the City of Lincoln was

⁶⁶ For purposes of estimating this quantity when viewed from the customer meter looking back to the “beginning” of the water supply distribution system, a slightly higher value is multiplied by the customer demands, then added to those demands to reflect a total projected demand. Thus, in Table 4-6, the value is shown as 10% since it is calculating the amount to add to the customer demand.

⁶⁷ City of Lincoln- 2013-2021 Housing Element Background Report, page 1, Table A-7.

⁶⁸ The income guidelines place households who make less than 80% of the median family income for an area as “low income”. This is in line with the CWC 10631.1 income threshold.

\$73,375 which is slightly below that of Placer County as a whole. The percentage of low income was used from the same housing element table. The income breaks in the reporting table do not line up perfectly with the low-income threshold. Based on an estimation from the data in the table in the housing element indicates approximately 42 percent of the population of Lincoln as low income. For lack of more detailed income distributions, this 42 percent is assumed to remain constant into the future. Using 42 percent of the projected population, the averaged demand factor from the single and multi-family housing units that ramps down into the future from 0.40 to 0.34 by 2040, the current and future demand from “lower income” customers is estimated (see **Table 4-7**).

Table 4-7 – Lower Income Water Demands

AFY	Current Projected	2020	2025	2030	2035	2040
Total Retail Treated Before Loss	8,169	10,074	11,440	13,374	15,308	18,507
Projected Lower Income Housing Demands	3,084	3,428	3,780	4,228	4,718	5,586
Percent of Treated Retail	38%	34%	33%	32%	31%	30%

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CHAPTER 5. WATER DEMAND MANAGEMENT MEASURES

5.1 Impact of SB X7-7

The City's 2010 UWMP followed a different set of requirements than the 2015 UWMP. In the 2010 Plan, fourteen specific demand management measures (DMMs) were discussed and outlined as was required by CWC 10631(f). However since 2010, new legislation has been passed modifying the required reporting for demand management measures for the 2015 UWMP. These changes were enacted under SBX7-7, which now requires UWMPs to include discussions of only six demand management measures. These measures are discussed below in **Section 5.2**. The City's implementation of DMM's continues to be successful as the City continues to show reductions in water use. The primary purpose behind the DMM requirements within the UWMP is to ensure that all urban water purveyors successfully meet their water conservation goals in light of the State's 2020 conservation requirements.

5.2 DMMs from 2010 to 2015

From 2010 to 2015 the City has continued to implement demand management measures to encourage and monitor continued water conservation. The City successfully completed implementing water meters for its entire service area before 2010. With the entire City now being monitored, the City is able to accurately cost water and record customer usage. A summary of some DMM programs can be found in **Table 5-1**, providing an overview for the last five years. In addition to the City's own programs, the City also participates in DMMs that are spearheaded by RWA, in conjunction with other local water agencies, including the City. **Table 5-2** provides the City's public information outreach programs for the past five years in relation to the Regional Water Authority.

Table 5-1 – Historic DMMs

Demand Management Measures	2011	2012	2013	2014	2015
Plumbing Retrofit Kits	0	0	0	0	0
Conservation Pricing	Yes	Yes	Yes	Yes	Yes
Mains and Lines Surveyed (miles)	0	0	0	0	0
Rebate Programs	2	2	2	2	2
Mainline Repairs	4	2	11	3	4
Service Line Repairs	36	48	34	38	61
Education Outreach Programs	10	10	10	10	10

Table 5-2 – RWA Public Outreach Programs

	2011	2012	2013	2014	2015
Bill Inserts/Newsletters/Brochures	Yes	Yes	Yes	Yes	Yes
Bill Water Use Comparison	Yes	Yes	Yes	Yes	Yes
Special Events/Media Events	Yes	Yes	Yes	Yes	Yes
Coordination with Other Programs	Yes	Yes	Yes	Yes	Yes
Youth Outreach	Yes	Yes	Yes	Yes	Yes

5.3 Current and Future DMM's

The City plans to continue with implementing its demand management measures from the previous years as highlighted by Table 5-1 and Table 5-2. In addition to those conservation measures, the City will also continue to administer the measures now required under CWC 10631(f)(B). These specific measures are discussed in detail below:

- ◆ *Water Waste Prevention Ordinances:* Water waste is prohibited by the City under the City's Municipal Code at section 15.28.130 Water Waste. Specifically, this section prohibits unfixed leaks. Additional prohibited actions, water use violations and enforcement of these prohibitions are discussed in greater detail in the Water Shortage Contingency Plan in **Section 6**.
- ◆ *Metering:* The City previously engaged in a metering campaign and successfully installed meters throughout its entire service area. The success of the City's meter installation and retrofit upgrades has enabled it to closely monitor water usage. By assessing annual water production for long-term trends. Furthermore the City's metering has allowed it to already meet its 2020 water reduction goal.
- ◆ *Conservation Pricing:* The City is fully metered and utilizes commodity billing based on the volumetric quantity of water used by each customer. This provides more accurate billing to each customer and allows the City to implement necessary rate adjustments based on long-term trends, to ensure that water conservation targets are being met. The City will continue to evaluate the effectiveness of its conservation-pricing program by monitoring its annual water production to assess long-term trends in water demand.
- ◆ *Public Education and Outreach:* The City has participated in a variety of public education and outreach programs as seen in **Table 5-2**. Many of the programs are sponsored by RWA in conjunction with urban water providers including the City. In addition to continuing classroom presentations, several art contests supporting the "Be Water Smart" campaign are supported by the City to provide educational outreach to schools. The City intends to continue to participate in these programs and perform community outreach through TV, print, media and online advertising for general public education.
- ◆ *Distribution System Loss:* The City monitors the percentage of unaccounted for water and repairs system leaks when found. As seen in **Table 5-1**, although there has been fluctuations in the past 5 years regarding the amount of unaccounted

water, the quantity lost in the system has reduced from 2014 to 2015. With the City fully metered, it is anticipated that sources of loss will be able to be located more quickly by the City and customers alike.

- ◆ *Program Coordination and Staffing:* To ensure that adequate resources are available for water conservation efforts, the City has a Water Conservation Practitioner, whose position is dedicated to developing, implementing and monitoring conservation efforts. In addition to the Water Conservation Practitioner, the City also utilizes public service staff to perform leak detection/repair.
- ◆ *Other Demand Management Measures:* The City continues to administer DMMs in addition to those required by CWC 10631(f)(B). These include; landscape conservation through irrigation regulations and by allowing customers to request water use audits to help improve conservation measures, offering retrofit plumbing kits, site surveys, and customer access to water use data.

CHAPTER 6. WATER SHORTAGE CONTINGENCY PLAN

The City has developed a Draft Water Shortage Resolution to adopt in the event of shortfalls in the water supply system and a Water Shortage Contingency Plan (WSCP) to address supply shortages. In the event of a catastrophic interruption of water supplies, the City would move to Stage 4 of its Water Shortage Contingency Plan. Additional efforts would be coordinated with PCWA, Placer County and the State Office of Emergency Services. The City would also increase its outreach and education efforts through the local media and education programs to focus attention on the water supply situation.

6.1 Water Shortage Contingency Resolution

The City has developed a Water Shortage Resolution that describes a mechanism to implement different Stages of Action during water supply shortage situations. Should a water supply shortage arise, the City Council will be able to react quickly to take the appropriate actions. A copy of the Water Shortage Resolution that is to be adopted for 2016 can be found in **Appendix B-4**. A copy of the WSCP is in **Appendix C-1**.

6.2 Stages of Action and Reduction Goals

The City's Water Shortage Contingency Plan consists of four Stages of Action to address potential water supply reductions of up to 50 percent. Upon the declaration of a water shortage by the City Council, the appropriate stage can be implemented. The stages, outlined in **Table 6-1**, include voluntary and mandatory water demand management measures that may be implemented as appropriate to address the severity and anticipated duration of the water supply shortage. Stages of Action may be triggered by 1) current supply conditions, 2) future supply conditions, 3) regulatory actions, or a 4) loss of supply due to natural or human induced disasters.

As an example of how the table can be used, if current water supplies were 85 –90 percent of normal, Stage 1 would be triggered. Stage 1 would also be triggered if future projected water supplies were estimated to be insufficient to provide 80 percent of normal deliveries for the next two years. Loss of water supply due to a natural or human induced disaster would trigger Stage 4.

Table 6-1 – Stages of Action and Water Supply Conditions

Water Shortage Stages and Triggering Mechanisms				
Stage of Action and Percent Reduction of Supply	Stage 1 Water Awareness Up to 15%	Stage 2 Water Alert 15 - 25%	Stage 3 Water Emergency 25 - 35%	Stage 4 Water Crisis 35 - 50%
Water Supply Condition				
Current Supply: Total Supply is ___% of Normal	85-90%	75-85%	65-75%	65%
Future Supply: Projected supply is insufficient to provide ___% of Deliveries for the Next Two Years	80%	75%	65%	50%
Disaster Loss				Disaster Loss

6.3 Mandatory Prohibitions on Water Waste

The Lincoln City Municipal Code⁶⁹ contains provisions that prohibit certain wasteful water use practices including those that are identified below:

The following conditions are included:

- 💧 All consumers, whether owners or not, shall maintain and keep in good repair the water pipes on the interior and exterior of the property served. Such persons shall not allow faucets or water closets to leak, and such fixtures must not be left running.⁷⁰
- 💧 Watering of lawns and gardens from an open hose is prohibited. A spray or nozzle must, in all cases, be used.⁷¹
- 💧 The city reserves the right to limit irrigation hours in the case of water shortages or emergencies.⁷²
- 💧 It is unlawful and an infraction for any person to cause or allow any water received by such person to flow away in unreasonable amounts, from property owned or occupied by such persons, in any gutter, ditch or other manner over the surface of the ground.⁷³

⁶⁹ Title 13 Public Services, Chapter 4 Water, Article VI Conservation

⁷⁰ City of Lincoln Municipal Code Section 13.04.410

⁷¹ City of Lincoln Municipal Code Section 13.04.420

⁷² City of Lincoln Municipal Code Section 13.04.430

⁷³ City of Lincoln Municipal Code Section 13.04.440

6.4 Penalties

The Lincoln City Municipal Code contains provisions for penalties to water customers that violate regulations and restrictions set forth in Article IX. – water conservation and penalties of the City of Lincoln’s Municipal Code.

6.5 Reduction Methods

6.5.1 Stage One – Water Awareness

All water consumers are encouraged to be aware of water consumption and use water wisely. These measures are expected to result in up to 10 percent reduction in water use. Water consumption should be limited to a reasonable level necessary to maintain the public health, business operations, and landscaping. The following restrictions apply:

- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ All hoses, when in use, shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation should not occur during precipitation events.
- ◆ Restaurants shall only serve water upon request to restaurant customers.

6.5.2 Stage Two - Water Alert

All water consumers shall comply with the following conservation measures to achieve between 10 and 20 percent reduction in normal water use:

- ◆ Outdoor irrigation of all ornamental turf shall be limited to no more than three days per week. The allowable days for irrigation will be established by the City Council through resolution.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses, when in use, shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation shall not occur during precipitation events.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.

- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.
- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All new pools constructed shall have pool covers.

6.5.3 Stage Three, Water Emergency

Water consumers shall comply with the following conservation measures to achieve between 20 and 35 percent reduction in normal water use:

- ◆ Outdoor irrigation of all ornamental turf shall be limited to no more than two days per week. The days of week allowed for irrigation shall be established by City Council through a resolution.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses when in use shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation shall not occur during precipitation events or within 24 hours of a rain event that produced .20 inches of precipitation or more.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.
- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All new pools constructed shall have pool covers.
- ◆ All restaurants that provide table service shall post, in a conspicuous place, a Notice of Drought Conditions, approved by the Director of Public Services, and shall not serve water except upon specific request by the customer.
- ◆ Boats and vehicles shall be washed only at commercial washing facilities equipped with water recycling equipment or by use of a bucket and hose equipped with a self-closing valve that requires operating positive pressure to activate the flow of water.
- ◆ Operators of hotels, motels, and other commercial establishments offering lodgings shall post in each room and at each site, a Notice of Drought Condition, approved by the Director of Public Services.
- ◆ The operation of and introduction of water into ornamental fountains that do not have a circulating system is prohibited.
- ◆ City Council may adopt additional water conservation regulations and restrictions.
- ◆ The planting or seeding of new ornamental turf is prohibited, including new turf planted or seeded to replace existing ornamental.

6.5.4 Stage Four - Water Crisis

Water consumers shall comply with the following conservation measures to achieve reductions between 35 and 50 percent reduction in normal water use:

- ◆ Irrigation of any yard or other landscaped area containing lawn or turf grass areas is prohibited. This prohibition does not apply to trees.
- ◆ The introduction of water into swimming pools and spas is prohibited except to maintain the structural integrity of such facilities.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses when in use shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation should not occur during precipitation events.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.
- ◆ Car, vehicle, boat, or equipment washing is prohibited.
- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All restaurants that provide table service shall post, in a conspicuous place, a Notice of Drought Conditions, approved by the Director of Public Services, and shall not serve water except upon specific request by the customer.
- ◆ Operators of hotels, motels, and other commercial establishments offering lodgings shall post in each room and at each site, a Notice of Drought Condition, approved by the Director of Public Services.
- ◆ The operation of and introduction of water into ornamental fountains is prohibited.
- ◆ The planting or seeding of new ornamental turf is prohibited, including new turf planted or seeded to replace existing ornamental.
- ◆ Such other and further regulations as the City Council may determine after a public hearing.
- ◆ City Council may adopt additional water conservation regulations and restrictions.

6.6 Revenue and Expenditure Impacts

Reduction in revenues from water sales due to temporary water supply shortages may have an impact on the City's ability to provide services. Some of the revenue loss may be offset by reduced costs to purchase treated water from PCWA.

6.7 Measures to Overcome Impacts

Rate increases may be necessary to offset decreased sales revenue, if deemed necessary by the City Council.

6.8 Reduction Measuring Mechanism

Treated surface water and groundwater deliveries are metered as the water flows into the City's distribution system. During various stages of alert, the frequency of measurement can be increased to better characterize demand and compare to reduction goals. This will allow the City to implement additional demand management measures if goals are not being met or relax some restrictions if demand goals are being exceeded.

6.9 Minimum Supply Available

As discussed in **Section 3**, the City of Lincoln has highly reliable water supplies. Currently, the City is not projecting a shortage in its water supplies during either a single-dry or multiple dry year periods. The total estimated minimum supply available for the next three years is approximately 16,100 acre-feet, however delivery infrastructure and plant capacity purchased will limit realistic supplies to those listed in **Table 6-2**.

Table 6-2 – Three-Year Minimum Supply Available

Acre Feet		
2016	2017	2018
10,165	10,391	11,154

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CHAPTER 7. SUPPLY & DEMAND INTEGRATION

The purpose of this chapter is to compare the total water supply sources available to the City with the total projected water use over the next 25 years, in five-year increments, for a normal water year, a single-dry water year, and multiple dry water years.⁷⁴ Water supply and demand data presented in Chapter 3, 4, and 6 is amalgamated in this section for purposes of summarizing the City's water supply reliability.

7.1 Normal Water Year Conditions

In normal water years, the City would anticipate full availability of its surface supplies under the contract delivery obligations of PCWA and NID as well as reliable raw water and non-potable water as available. The City will also use groundwater assets to balance its water supply portfolio as needed to meet peaking conditions. The City is in the unique position to only capture, pay for, and use the volume of water that it needs to meet its annual demands through its contract entitlements and groundwater pumping. In other words, although the wholesale agencies have more supplies available, the City must only acquire what it needs to meet its demands – it has additional rights. Therefore, in assessing long-term supply reliability, the total supplies equal the total demands. The resulting anticipated supplies acquired shown in **Chapter 3** and the forecasted demands from **Chapter 4** are shown in **Table 7-1**. As demonstrated, the City projects adequate water supplies to meet its demands through 2040.

Table 7-1 – Supply and Demand Comparison (Normal Year)

(acre-feet/yr)	2020	2025	2030	2035	2040
Supplies	11,192	12,710	14,859	17,007	20,561
Demands	11,192	12,710	14,859	17,007	20,561
Difference	0	0	0	0	0

7.2 Single Dry Year Conditions

In a single dry year condition, the City's forecast water demands are expected to increase. This demand increase represents the generalized expansion of the landscape irrigation season due to limited rainfall – meaning customers begin demanding landscape irrigation supplies from the City earlier in the spring than during a normal year when rainfall would otherwise satisfy landscape water needs. Though the increase is dependent on actual

⁷⁴ This is consistent with CWC Section 10635, but extends the period an additional 5 years to provide “20 year” analysis coverage for the intervening years between UWMP updates.

conditions, it is represented by adjusting the normal year annual forecast demand value upward by 5 percent for each 5-year increment to 2040. This adjustment reflects rudimentary relationships between, historic use variances and other conditions and is meant only to highlight the anticipated increase in demands for purposes of City planning.

Because of the increased demand in a single dry year, the City should anticipate an increase in supply deliveries, as described in **Chapter 3**, the City's dry year supplies are firm even though the mix of supplies to meet its demands may change.

As shown in **Table 7-2**, the City anticipates adequate water supplies in single dry years through 2040. It is important to note, however, that the demand associated with industrial facilities remains constant through the dry year conditions. This is done out of an abundance of caution in order to provide a conservative estimate of the impacts of industrial demands on the City's water supply system.

Table 7-2 – Supply and Demand Comparison (Single Dry-Year)

(acre-feet/yr)	2020	2025	2030	2035	2040
Supplies	11,751	13,346	15,453	17,517	21,178
Demands	11,751	13,346	15,453	17,517	21,178
Difference	0	0	0	0	0

7.3 Multiple Dry Year Conditions

For purposes of this UMWP, the City has assessed a three-year series of dry conditions. As detailed in Chapter 3 and contrary to the conditions in a single dry year, the City anticipates reductions in available water supplies during the second and third years of multiple dry years, consistent with PCWA's and NID's water supply forecasting. Although the total water supply available may not vary across each of the three years as the City may be able to access groundwater supplies to augment the available surface water assets.⁷⁵

Demand, however, will vary across this planning scenario. This variance is represented by setting the forecast demands for the first of three years equal to the demand used in the single dry year scenario. In the second year, the City would anticipate that its water

⁷⁵ As described in Chapter 3, PCWA and NID supplies may become more constrained during a prolonged drought, such as the drought that began in 2013. But, as noted in that chapter, the City has groundwater assets that would be available when certain other supplies from PCWA and NID are constrained. And, in extreme conditions, as occurred in 2015, the City will implement mandatory conservation actions.

shortage contingency plan (WSCP) would be triggered as detailed in Chapter 6 the WSCP activation, resulting in a demand reduction for each year it is used. The rationale for triggering the WSCP is that water assets from the wholesale agencies may be reduced per those agencies water supply shortage provisions under their rights and assets as well as PG&E contracts. Thus, the City's WSCP Stage 2 reduction target is assumed as described in Chapter 6. Similarly, in the third year, the City would expect further reductions resulting from implementing further WSCP actions. For this third year, the City's Stage 4 reduction target is assumed. However, as described in **Section 7.2**, the City assumes full deliveries will be maintained to its industrial facilities.

This resulting analysis has been represented in **Table 7-3**. During each multiple dry year period projected in **Table 7-3**, the City anticipates adequate water supplies being available. During the first dry year voluntary conservation is assumed. For the second and third dry years, it is assumed the City will have enacted its WSCP and be at Stage 2 and Stage 4 respectively.

Table 7-3 – Supply and Demand Comparison (Multiple Dry Years)

Dry Year 1

(acre-feet/yr)	2020	2025	2030	2035	2040
Supplies	11,751	13,346	15,453	17,517	21,178
Demands	11,751	13,346	15,453	17,517	21,178
Difference	0	0	0	0	0

Dry Year 2

(acre-feet/yr)	2020	2025	2030	2035	2040
Supplies	10,576	12,011	13,908	15,766	19,060
Demands	10,576	12,011	13,908	15,766	19,060
Difference	0	0	0	0	0

Dry Year 3

(acre-feet/yr)	2020	2025	2030	2035	2040
Supplies	9,401	10,677	12,363	14,014	16,942
Demands	9,401	10,677	12,363	14,014	16,942
Difference	0	0	0	0	0

APPENDICES

Appendix A

This appendix section shall contain all compliance and reporting related documents

Appendix A-1	DWR Recommended Tables
Appendix A-2	DWR Checklist
Appendix A-3	SBX7-7 Compliance Form
Appendix A-4	AWWA Water Audit Form

Appendix B

This appendix section shall contain all agency related documents

Appendix B-1	Resolution Adopting the 2015 UWMP
Appendix B-2	Copies of General Notice Publications
Appendix B-3	Copies of Notification Letters

Appendix C

This appendix section shall contain conservation related documents

Appendix C-1	Water Shortage Contingency Plan
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Appendix A-1: DWR Recommended Tables

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NOTES FOR REGIONAL URBAN WATER MANAGEMENT PLANS (RUWMPs)
RUWMPs will report data for each agency in the RUWMP, requiring duplicates of the standardized tables. The supplier will copy the needed tables and notate each of the copies with the name of the agency, or some other designation, identifying the table with the corresponding agency.
WUEdata upload tool for RUWMPs
RUWMPs will submit data to the WUEdata upload tool on an individual agency basis.
If the RUWMP contains a Regional Alliance, the Regional Alliance information will be uploaded separately from the individual agency information.

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA311004	City of Lincoln	18,822	7,629
TOTAL		18,822	7,629

NOTES: See Chapter 2

Table 2-2: Plan Identification		
Select Only One	Type of Plan	Name of RUWMP or Regional Alliance <i>if applicable</i> <i>drop down list</i>
<input checked="" type="checkbox"/>	Individual UWMP	
	<input type="checkbox"/> Water Supplier is also a member of a RUWMP	
	<input type="checkbox"/> Water Supplier is also a member of a Regional Alliance	
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)	
NOTES:		

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
<input type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES: See Chapter 2	

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name <i>(Add additional rows as needed)</i>
Placer County Water Agency
Nevada Irrigation District
NOTES:See Chapter 2

Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040(opt)
	45,837	53,747	62,153	73,175	86,001	102,563

NOTES: See Chapter 2

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type <i>(Add additional rows as needed)</i>	2015 Actual		
Drop down list <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>	Additional Description <i>(as needed)</i>	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Other	Sum of all 2015 customer demands	Drinking Water	7,628
TOTAL			7,628
NOTES: See Chapter 4.			

Table 4-2 Retail: Demands for Potable and Raw Water - Projected

Use Type <i>(Add additional rows as needed)</i>	Additional Description <i>(as needed)</i>	Projected Water Use <i>Report To the Extent that Records are Available</i>				
<u>Drop down list</u> <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>		2020	2025	2030	2035	2040-opt
Single Family		7,754	8,720	10,081	11,675	13,883
Multi-Family		644	790	955	1,162	1,358
Commercial		373	515	736	813	1,150
Industrial		17	17	17	17	397
Institutional/Governmental		119	138	218	218	235
Landscape		1,166	1,260	1,367	1,423	1,483
Losses		1,118	1,270	1,485	1,699	2,054
TOTAL		11,192	12,710	14,859	17,007	20,561
NOTES: See Chapter 4						

Table 4-3 Retail: Total Water Demands

	2015	2020	2025	2030	2035	2040 (opt)
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	7,628	11,192	12,710	14,859	17,007	20,561
Recycled Water Demand* <i>From Table 6-4</i>	0	0	0	0	0	0
TOTAL WATER DEMAND	7,628	11,192	12,710	14,859	17,007	20,561

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES: See Chapter 3 and Chapter 4

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2013	907
* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.	
NOTES: See Appendix A-4. The City is working to prepare its AWWA files. The numbers above represent 2013 losses.	

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i>	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	page 4-7
Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i>	Yes
NOTES:	

Table 5-1 Baselines and Targets Summary*Retail Agency or Regional Alliance Only*

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	2000	2009	241	217	193
5 Year	2005	2009	239		

*All values are in Gallons per Capita per Day (GPCD)

NOTES: See Appendix A-3

Table 5-2: 2015 Compliance*Retail Agency or Regional Alliance Only*

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD					2015 GPCD* <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Enter "0" if no adjustment is made <i>Methodology 8</i>						
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
149	217	0	0	0	0	149	149	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES: See Chapter 4

Table 6-1 Retail: Groundwater Volume Pumped

<div> <div></div> </div>		Supplier does not pump groundwater. The supplier will not complete the table below.				
Groundwater Type <i>Drop Down List</i> <i>May use each category multiple times</i>	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
Alluvial Basin	North American Groundwater Subbasin	2561	2722	1066	691	707
TOTAL		2,561	2,722	1,066	691	707
NOTES: See Chapter 3						

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015

<input type="checkbox"/>	There is no wastewater collection system. The supplier will not complete the table below.					
100	Percentage of 2015 service area covered by wastewater collection system <i>(optional)</i>					
100	Percentage of 2015 service area population covered by wastewater collection system <i>(optional)</i>					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? <i>Drop Down List</i>	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? <i>Drop Down List</i>	Is WWTP Operation Contracted to a Third Party? <i>(optional)</i> Drop Down List
<i>Add additional rows as needed</i>						
City of Lincoln	Estimated	3,300	City of Lincoln	Lincoln Wastewater Treatment and Reclamation System	Yes	
Total Wastewater Collected from Service Area in 2015:		3,300				
NOTES: The Treatment plan is located within the sphere of influence.						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015

<div><div></div></div>	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional)	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level <i>Drop down list</i>	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
Lincoln Regional Wastewater Treatment Plant	Auburn Ravine	Outfall to Creek		River or creek outfall	No	Tertiary				
Total							0	0	0	0
NOTES:										

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

<div> <div></div> <div>Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.</div> </div>								
Name of Agency Producing (Treating) the Recycled Water:		City of Lincoln						
Name of Agency Operating the Recycled Water Distribution System:		City of Lincoln						
Supplemental Water Added in 2015		0						
Source of 2015 Supplemental Water		N/A						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment <i>Drop down list</i>	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)								
Golf course irrigation								
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)*								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other (Provide General Description)								
		Total:	0	0	0	0	0	0
*IPR - Indirect Potable Reuse								
NOTES: See Chapter 3 for further details. Recycled water is expected to be a supply.								

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

<div></div>	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 Actual Use
Agricultural irrigation	0	0
Landscape irrigation (excludes golf courses)		
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Surface water augmentation (IPR)		
Direct potable reuse		
Other	<i>Type of Use</i>	
Total		0

NOTES: See Chapter 3 and 2010 UWMP. Recycled water was used for local ag irrigation, that is no part of the City's demands.

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
I	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
See Chapter 3	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
<i>Add additional rows as needed</i>			
Total			0
NOTES: The City plans to expand its recycled water, please see Chpater 3 for further discussions.			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
<input type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input checked="" type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
See Chapter 3	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i>	Expected Increase in Water Supply to Agency <i>This may be a range</i>
	<i>Drop Down List (y/n)</i>	<i>If Yes, Agency Name</i>				
<i>Add additional rows as needed</i>						
NOTES:						

Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
Drop down list <i>May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Actual Volume	Water Quality <i>Drop Down List</i>	Total Right or Safe Yield <i>(optional)</i>
Add additional rows as needed				
Purchased or Imported Water	PCWA/NID	6,921	Drinking Water	
Groundwater		707	Drinking Water	
Total		7,628		0
NOTES: See Chapter 3				

Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply Report To the Extent Practicable									
Drop down list <i>May use each category multiple times.</i> <i>These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		2020		2025		2030		2035		2040 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Other	All City supplies	11,192		12,710		14,859		17,007		20,561	
Total		11,192	0	12,710	0	14,859	0	17,007	0	20,561	0

NOTES: See discussion in Chapter 3

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year <i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i>	Available Supplies if Year Type Repeats	
		<input checked="" type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location <u>Chapter 3.7</u>
		<input type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	2011		100%
Single-Dry Year	2015		
Multiple-Dry Years 1st Year	2013		
Multiple-Dry Years 2nd Year	2014		
Multiple-Dry Years 3rd Year	2015		
Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			
NOTES: See Chapter 3 for details and volume discussion			

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (<i>Opt</i>)
Supply totals (<i>autofill from Table 6-9</i>)	11,192	12,710	14,859	17,007	20,561
Demand totals (<i>autofill from Table 4-3</i>)	11,192	12,710	14,859	17,007	20,561
Difference	0	0	0	0	0
NOTES: See Chapter 3 and 7.					

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	11,751	13,346	15,453	17,517	21,178
Demand totals	11,751	13345.708	15,453	17,517	21,178
Difference	0	0	0	0	0
NOTES: See Chapter 7					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	11,751	13,346	15,453	17,517	21,178
	Demand totals	11,751	13,346	15,453	17,517	21,178
	Difference	0	0	0	0	0
Second year	Supply totals	10,576	12,011	13,908	15,766	19,060
	Demand totals	10,576	12,011	13,908	15,766	19,060
	Difference	0	0	0	0	0
Third year	Supply totals	9,401	10,677	12,363	14,014	16,942
	Demand totals	9,401	10,677	12,363	14,014	16,942
	Difference	0	0	0	0	0

NOTES: See Chapter 7.

**Table 8-1 Retail
Stages of Water Shortage Contingency Plan**

Stage	Complete Both	
	Percent Supply Reduction ¹ <i>Numerical value as a percent</i>	Water Supply Condition <i>(Narrative description)</i>
<i>Add additional rows as needed</i>		
1	15%	When the current supply is 85-90% of the normal supply of the projected future supply is at 80%
2	15-25%	When the current supply is 75-85% of the normal supply of the projected future supply is at 75%
3	25-35%	When the current supply is 65-75% of the normal supply of the projected future supply is at 65%
4	35-50%	When the current supply is 65% of the normal supply of the projected future supply is at 50%
¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: See Chapter 6		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses

Stage	Restrictions and Prohibitions on End Users <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement? <i>Drop Down List</i>
<i>Add additional rows as needed</i>			
1	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
1	Other - Require automatic shut of hoses		Yes
1	Landscape - Other landscape restriction or prohibition	during precipitation events	Yes
1	CII - Restaurants may only serve water upon request		Yes
2	Landscape - Limit landscape irrigation to specific days	3 days a week	Yes
2	Landscape - Limit landscape irrigation to specific times	No irrigation between 8am and 9pm	Yes
2	Pools and Spas - Require covers for pools and spas	Require'd of all new pools	Yes
3	Landscape - Limit landscape irrigation to specific days	2 days a week	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
4	Landscape - Prohibit all landscape irrigation	Tree exception	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
4	Water Features - Restrict water use for decorative water features, such as fountains		Yes
NOTES: See Chapter 6			

Table 8-3 Retail Only:
Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference <i>(optional)</i>
Add additional rows as needed		
1	Implement or Modify Drought Rate Structure or Surcharge	This may be implimented at any stage if adopted by the City Council
3	Expand Public Information Campaign	Requiring Notice of Drought Condition to be posted.
3	Other	Additional action can be adopted by the City Council
NOTES: See Chapter 6		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	10,165	10,391	11,154
NOTES: See Chapter 6			

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
City of Roseville	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
Placer County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
See Chapter 1.2 and Appendix B-3 for additional entities contacted		

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Appendix A-2: DWR Checklist

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2015 UWMP Checklist

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	1.1
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	1.2
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	1.2 App. 3.3
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	2.1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	2.1
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	2.1
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	2.1
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	2.1
10631€(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	4.3
10631€(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	App. 4
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	4.3
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	4.2
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and	Baselines and Targets	Chapter 5 and App E	4.2, 4.3

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	4.2, 4.3
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	4.2
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	4.2
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	n/a
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	App. 4-3
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	3.3
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	3.1
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	3.3
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	3.3
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	3.3
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	3.3
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water	System Supplies	Section 6.2.4	3.3

	supplier for the past five years			
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	3.3
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	3.6
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	3.7, 7
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	3.5
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any – with water use projections from that source.	System Supplies	Section 2.5.1	3
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	n/a
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	2.2,
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	3.4
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	3.4
10633©	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	3.4
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	3.4
10633€	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	3.4

10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	3.4
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	3.4
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	3.7
10631©(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	3.7
10631©(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	3.7, 7
10631©(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	3.7, 7
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	3
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	3.7, 7
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	6.2, App.C-1
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	6.9
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	App. C-1
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	6.3 App. C-1
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	6.5 App. C-1
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency	Section 8.3	6.4 App. C-1

		Planning		
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	6.6 App. C-1
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	App. C-1
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	6.8 App. C-1
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	5.3
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	n/a
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	n/a
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	1.3 App. B-3
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	1.2 App. B-3
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	1.3
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	C-1
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the	Plan Adoption, Submittal, and	Sections 10.2.2, 10.3,	1.3 App. B-2

	public hearing, and held a public hearing about the plan.	Implementation	and 10.5	
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	1.3, App. B-2
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	1.3 App B-1
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	1.3
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	1.3
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	1.3
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	1.3

Appendix A-3: SBX7-7 Compliance Forms

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SB X7-7 Verification Form Version FINAL.1

Table 4-C.4 has been modified from the FINAL version.

WUEdata Entry Exceptions	
The data from the tables below will not be entered into WUEdata tables (the tabs for these tables' worksheets are colored purple). These tables will be submitted as separate uploads, in Excel, to WUEdata.	
Process Water Deduction 7 tables 4-C, 4-C.1, 4-C.2, 4-C.3, 4-C.4 and 4-D that will use the process water deduction will complete the appropriate tables in Excel, submit them as a separate upload to the WUE data tool, and include them in its UWMP.	SB X7- A supplier
Target Method 2 X7-7 tables 7-B, 7-C, and 7-D supplier that selects Target Method 2 will contact DWR (gwen.huff@water.ca.gov) for SB X7-7 tables 7-B, 7-C, and 7-D.	SB A
Target Method 4 tables are only available online at http://www.dwr.water.ca.gov/wateruseefficiency/sb7/committees/urban/u4/ptm4.cfm selects Target Method 4 will save the tables from the website listed above, complete the tables, submit as a separate upload to WUE data, and include them with its UWMP.	These A supplier that

SB X7-7 Table 0: Units of Measure Used in UWMP* <i>(select one from the drop down list)</i>
--

Acre Feet

<i>*The unit of measure must be consistent with Table 2-3</i>

NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	10,522	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period ^{1, 2}	10	Years
	Year beginning baseline period range	2000	
	Year ending baseline period range ³	2009	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2005	
	Year ending baseline period range ⁴	2009	

¹If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. ² The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.

³The ending year must be between December 31, 2004 and December 31, 2010.

⁴The ending year must be between December 31, 2007 and December 31, 2010.

NOTES: See Chapter 4

SB X7-7 Table 2: Method for Population Estimates**Method Used to Determine Population**
(may check more than one)**1. Department of Finance (DOF)**
DOF Table E-8 (1990 - 2000) and (2000-2010) and
DOF Table E-5 (2011 - 2015) when available**2. Persons-per-Connection Method****3. DWR Population Tool****4. Other**
DWR recommends pre-review

NOTES: See Chapter 4

SB X7-7 Table 3: Service Area Population

Year		Population
10 to 15 Year Baseline Population		
Year 1	2000	11,205
Year 2	2001	13,716
Year 3	2002	17,089
Year 4	2003	20,387
Year 5	2004	24,011
Year 6	2005	28,083
Year 7	2006	34,342
Year 8	2007	38,360
Year 9	2008	40,726
Year 10	2009	41,787
5 Year Baseline Population		
Year 1	2005	28,083
Year 2	2006	34,342
Year 3	2007	38,360
Year 4	2008	40,726
Year 5	2009	41,787
2015 Compliance Year Population		
2015		45,837
NOTES: See Chapter 4		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year <i>Fm SB X7-7 Table 3</i>		Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
10 to 15 Year Baseline - Gross Water Use								
Year 1	2000	2,610			-		-	2,610
Year 2	2001	3,734			-		-	3,734
Year 3	2002	4,776			-		-	4,776
Year 4	2003	5,388			-		-	5,388
Year 5	2004	7,541			-		-	7,541
Year 6	2005	8,343			-		-	8,343
Year 7	2006	9,376			-		-	9,376
Year 8	2007	10,320			-		-	10,320
Year 9	2008	10,522			-		-	10,522
Year 10	2009	10,155			-		-	10,155
10 - 15 year baseline average gross water use								7,277
5 Year Baseline - Gross Water Use								
Year 1	2005	8,343			-		-	8,343
Year 2	2006	9,376			-		-	9,376
Year 3	2007	10,320			-		-	10,320
Year 4	2008	10,522			-		-	10,522
Year 5	2009	10,155			-		-	10,155
5 year baseline average gross water use								9,743
2015 Compliance Year - Gross Water Use								
2015		7,628	-		-		-	7,628

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: See Chapter 4

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source All Sources

This water source is:

☒ The supplier's own water source

☒ A purchased or imported source

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System			
Year 1	2000	2,610	2,610
Year 2	2001	3,734	3,734
Year 3	2002	4,776	4,776
Year 4	2003	5,388	5,388
Year 5	2004	7,541	7,541
Year 6	2005	8,343	8,343
Year 7	2006	9,376	9,376
Year 8	2007	10,320	10,320
Year 9	2008	10,522	10,522
Year 10	2009	10,155	10,155
5 Year Baseline - Water into Distribution System			
Year 1	2005	8,343	8,343
Year 2	2006	9,376	9,376
Year 3	2007	10,320	10,320
Year 4	2008	10,522	10,522
Year 5	2009	10,155	10,155
2015 Compliance Year - Water into Distribution System			
2015	7,628		7,628
* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document			

NOTES: See Chapter 3 and 4.

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)

Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Annual Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2000	11,205	2,610	208
Year 2	2001	13,716	3,734	243
Year 3	2002	17,089	4,776	250
Year 4	2003	20,387	5,388	236
Year 5	2004	24,011	7,541	280
Year 6	2005	28,083	8,343	265
Year 7	2006	34,342	9,376	244
Year 8	2007	38,360	10,320	240
Year 9	2008	40,726	10,522	231
Year 10	2009	41,787	10,155	217
10-15 Year Average Baseline GPCD				241
5 Year Baseline GPCD				
Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use
Year 1	2005	28,083	8,343	265
Year 2	2006	34,342	9,376	244
Year 3	2007	38,360	10,320	240
Year 4	2008	40,726	10,522	231
Year 5	2009	41,787	10,155	217
5 Year Average Baseline GPCD				239
2015 Compliance Year GPCD				
2015		45,837	7,628	149
NOTES: See Chapter 4				

SB X7-7 Table 6: Gallons per Capita per Day
Summary From Table SB X7-7 Table 5

10-15 Year Baseline GPCD	241
5 Year Baseline GPCD	239
2015 Compliance Year GPCD	149

NOTES: See Chapter 4

SB X7-7 Table 7: 2020 Target Method*Select Only One*

Target Method		Supporting Documentation
<input checked="" type="checkbox"/>	Method 1	SB X7-7 Table 7A
<input type="checkbox"/>	Method 2	SB X7-7 Tables 7B, 7C, and 7D <i>Contact DWR for these tables</i>
<input type="checkbox"/>	Method 3	SB X7-7 Table 7-E
<input type="checkbox"/>	Method 4	Method 4 Calculator

NOTES: See Chapter 4

SB X7-7 Table 7-A: Target Method 1	
20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
241	193
NOTES: See Chapter 4	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD <i>From SB X7-7 Table 5</i>	Maximum 2020 Target ¹	Calculated 2020 Target ²	Confirmed 2020 Target
239	227	193	193

¹Maximum 2020 Target is 95% of the 5 Year Baseline GPCD
²2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.

NOTES: Chapter 4

SB X7-7 Table 8: 2015 Interim Target GPCD

Confirmed 2020 Target <i>Fm SB X7-7 Table 7-F</i>	10-15 year Baseline GPCD <i>Fm SB X7-7 Table 5</i>	2015 Interim Target GPCD
193	241	217

NOTES: See chapter 4

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments <i>(in GPCD)</i>					2015 GPCD <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015?
		Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD		
		Extraordinary Events	Weather Normalization	Economic Adjustment				
149	217	-	-	-	-	149	149	YES

NOTES: See Chapter 4

Appendix A-4: AWWA Water Audit Form

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PLACE HOLDER FOR AWWA FORM

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Appendix B-1: Resolution Adopting the 2015 UWMP

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PLACE HOLDER FOR ADOPTION OF 2015 UWMP RESOLUTION

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Appendix B-2: Copies of General Notice Publications

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**NOTICE OF AVAILABILITY OF CITY OF LINCOLN DRAFT 2015 URBAN WATER
MANAGEMENT PLAN UPDATE AND PUBLIC HEARING TO RECEIVE COMMENTS**

NOTICE IS HEREBY GIVEN that the City of Lincoln Draft 2015 Urban Water Management Plan Update (Draft Update) will be made available for public review and comment, and that the City Council of the City of Lincoln has set a public hearing to receive comments on the Draft Update. The public hearing is to be conducted on July 12, 2016 at 6:00 p.m. at the regularly scheduled City Council meeting, which will be held at City Hall. Lincoln City Hall is located at 600 Sixth Street, Lincoln, CA 95648.

NOTICE IS FURTHER GIVEN that, as part of the public hearing on the Draft Update, the City of Lincoln will conduct a public hearing to: (1) adopt a method, pursuant to California Water Code (CWC) § 10608.20, for determining its urban water use target in 2020, (2) allow community input regarding its plan for achieving its urban water use target, and (3) consider the economic impacts of its plan for achieving its urban water use target.

Administrative remedies must be exhausted prior to action being initiated in a court of law. If you challenge these actions in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice or in written correspondence delivered to the Development Services Department at, or prior to, the public hearing.

The City of Lincoln and the State of California do not discriminate in the housing or employment on the basis of race, religion, sex, age, national origin, or handicap. The location of the public hearing is fully accessible to mobility impaired individuals. In compliance with the California Disability Access Guidelines, the City of Lincoln encourages those persons with disabilities to participate fully in the public hearing process. If you have special needs to allow you to attend or participate in this public hearing process, please contact our office prior to the public hearing, so that we may accommodate you.

Copies of the Draft Update will be made available for public review at the City of Lincoln website www.lincolncalifornia.gov on and after June 30, 2016 or available in hard copy at the office of the City Manager (City Hall) for review on-site. Members of the public are invited to present their views on the Draft Update. Comments may be presented during the public hearing or may be submitted in writing prior to the hearing, addressed to Matthew Wheeler, Community Development Director, mailed to City of Lincoln, 600 Sixth Street, Lincoln, CA 95648 or e-mailed to Matthew.Wheeler@lincolncalifornia.gov

Gwen Scanlon
City Clerk

DATE:	June 14, 2016
PUBLISH:	June 23, 2016 and June 30, 2016 Lincoln News-Messenger
CUSTOMER #:	16049757

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Appendix B-3: Copies of Notification Letters

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**NOTICE OF AVAILABILITY OF CITY OF LINCOLN DRAFT 2015 URBAN WATER
MANAGEMENT PLAN UPDATE AND PUBLIC HEARING TO RECEIVE COMMENTS**

NOTICE IS HEREBY GIVEN that the City of Lincoln Draft 2015 Urban Water Management Plan Update (Draft Update) will be made available for public review and comment, and that the City Council of the City of Lincoln has set a public hearing to receive comments on the Draft Update. The public hearing is to be conducted on July 12, 2016 at 6:00 p.m. at the regularly scheduled City Council meeting, which will be held at City Hall. Lincoln City Hall is located at 600 Sixth Street, Lincoln, CA 95648.

NOTICE IS FURTHER GIVEN that, as part of the public hearing on the Draft Update, the City of Lincoln will conduct a public hearing to: (1) adopt a method, pursuant to California Water Code (CWC) § 10608.20, for determining its urban water use target in 2020, (2) allow community input regarding its plan for achieving its urban water use target, and (3) consider the economic impacts of its plan for achieving its urban water use target.

Administrative remedies must be exhausted prior to action being initiated in a court of law. If you challenge these actions in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice or in written correspondence delivered to the Development Services Department at, or prior to, the public hearing.

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Copies of the Draft Update will be made available for public review at the City of Lincoln website www.lincolncalifornia.gov on and after June 30, 2016 or available in hard copy at the office of the City Manager (City Hall) for review on-site. Members of the public are invited to present their views on the Draft Update. Comments may be presented during the public hearing or may be submitted in writing prior to the hearing, addressed to Matthew Wheeler, Community Development Director, mailed to City of Lincoln, 600 Sixth Street, Lincoln, CA 95648 or e-mailed to Matthew.Wheeler@lincolncalifornia.gov

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:28:46 PM Pacific Daylight Time

From: Matthew Wheeler

To: Michele Kingsbury (mkingsbu@placer.ca.gov), Ken Grehm (KGrehm@placer.ca.gov)

CC: Matthew Brower, GM Tully (gtully@tullyandyoung.com), Pam Mathus

Michele and Ken:

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update. Please don't hesitate to contact me if you have questions or would like to discuss.

Thank you,

Matthew J. Wheeler, P.E.

Community Development Director

City of Lincoln

600 Sixth Street

Lincoln, CA 95648

916-434-3241 (W)

916-640-9148 (M)

Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:30:45 PM Pacific Daylight Time

From: Matthew Wheeler

To: Einar Maisch (elmaisch@pcwa.net)

CC: Brent Smith (BSmith@pcwa.net), Tony Firenzi (tfirenzi@pcwa.net), Matthew Brower, Pam Mathus, GM Tully (gtully@tullyandyoung.com), Ray Leftwich, Jennifer Hanson

Mr. Maisch:

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update. Please don't hesitate to contact me if you have questions or would like to discuss. Thank you,

Matthew J. Wheeler, P.E.
Community Development Director

City of Lincoln

600 Sixth Street
Lincoln, CA 95648
916-434-3241 (W)
916-640-9148 (M)
Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:27:32 PM Pacific Daylight Time

From: Matthew Wheeler

To: Paul Joiner

CC: Matthew Brower, Pam Mathus, GM Tully (gtully@tullyandyoung.com)

Sacramento Area Council of Governments

Attn: Mr. Paul Joiner

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update.

Please don't hesitate to contact me if you have questions or would like to discuss.

Thank you,

Matthew J. Wheeler, P.E.

Community Development Director

City of Lincoln

600 Sixth Street

Lincoln, CA 95648

916-434-3241 (W)

916-640-9148 (M)

Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:29:31 PM Pacific Daylight Time

From: Matthew Wheeler

To: Kelye McKinney (KMckinney@roseville.ca.us)

CC: Kevin Payne (kpayne@roseville.ca.us), Matthew Brower, GM Tully (gtully@tullyandyoung.com), Pam Mathus

Ms. McKinney:

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update. Please don't hesitate to contact me if you have questions or would like to discuss.

Thank you,

Matthew J. Wheeler, P.E.

Community Development Director

City of Lincoln

600 Sixth Street

Lincoln, CA 95648

916-434-3241 (W)

916-640-9148 (M)

Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:31:33 PM Pacific Daylight Time

From: Matthew Wheeler

To: Remleh Scherzinger (Scherzinger@nidwater.com)

CC: Gary King (king@nidwater.com), Tim Crough, Matthew Brower, GM Tully (gtully@tullyandyoung.com), Ray Leftwich, Jennifer Hanson, Pam Mathus

Mr. Scherzinger:

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update. Please don't hesitate to contact me if you have questions or would like to discuss.

Thank you,

Matthew J. Wheeler, P.E.

Community Development Director

City of Lincoln

600 Sixth Street

Lincoln, CA 95648

916-434-3241 (W)

916-640-9148 (M)

Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

Subject: Lincoln 2015 UWMP Public Hearing Notice

Date: Tuesday, June 14, 2016 at 3:26:13 PM Pacific Daylight Time

From: Matthew Wheeler

To: Audie Foster (Audie.Foster@amwater.com), Deana Donohue (Deana.Donohue@amwater.com)

CC: Matthew Brower, Pam Mathus, GM Tully (gtully@tullyandyoung.com)

Audie & Deana:

Attached you will find a Notice of Public Hearing for the City of Lincoln's 2015 UWMP Update.
Please don't hesitate to contact me if you have questions or would like to discuss.

Thank you,

Matthew J. Wheeler, P.E.

Community Development Director

City of Lincoln

600 Sixth Street

Lincoln, CA 95648

916-434-3241 (W)

916-640-9148 (M)

Matthew.Wheeler@lincolncalifornia.gov

~ Lincoln, A City of Opportunity ~

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Appendix B-4: Water Shortage Contingency Plan Draft Resolution

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**PLACE HOLDER FOR ADOPTION OF DRAFT WATER SHORTAGE
CONTIGENCY PLAN RESOLUTION**

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Appendix C-1: Water Shortage Contingency Plan

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WATER SHORTAGE CONTINGENCY PLAN

The City has developed a Draft Water Shortage Resolution to adopt in the event of shortfalls in the water supply system and a Water Shortage Contingency Plan (WSCP) to address supply shortages. In the event of a catastrophic interruption of water supplies, the City would move to Stage 4 of its Water Shortage Contingency Plan. Additional efforts would be coordinated with PCWA, Placer County and the State Office of Emergency Services. The City would also increase its outreach and education efforts through the local media and education programs to focus attention on the water supply situation.

6.1 Water Shortage Contingency Resolution

The City has developed a Water Shortage Resolution that describes a mechanism to implement different Stages of Action during water supply shortage situations. Should a water supply shortage arise, the City Council will be able to react quickly to take the appropriate actions.

6.2 Stages of Action and Reduction Goals

The City's Water Shortage Contingency Plan consists of four Stages of Action to address potential water supply reductions of up to 50 percent. Upon the declaration of a water shortage by the City Council, the appropriate stage can be implemented. The stages, outlined in **Table 1**, include voluntary and mandatory water demand management measures that may be implemented as appropriate to address the severity and anticipated duration of the water supply shortage. Stages of Action may be triggered by 1) current supply conditions, 2) future supply conditions, 3) regulatory actions, or a 4) loss of supply due to natural or human induced disasters.

As an example of how the table can be used, if current water supplies were 85 –90 percent of normal, Stage 1 would be triggered. Stage 1 would also be triggered if future projected water supplies were estimated to be insufficient to provide 80 percent of normal deliveries for the next two years. Loss of water supply due to a natural or human induced disaster would trigger Stage 4.

Table 1 – Stages of Action and Water Supply Conditions

Water Shortage Stages and Triggering Mechanisms				
Stage of Action and Percent Reduction of Supply	Stage 1 Water Awareness Up to 15%	Stage 2 Water Alert 15 - 25%	Stage 3 Water Emergency 25 - 35%	Stage 4 Water Crisis 35 - 50%
Water Supply Condition				
Current Supply: Total Supply is ___% of Normal	85-90%	75-85%	65-75%	65%
Future Supply: Projected supply is insufficient to provide ___% of Deliveries for the Next Two Years	80%	75%	65%	50%
Disaster Loss				Disaster Loss

6.3 Mandatory Prohibitions on Water Waste

The Lincoln City Municipal Code¹ contains provisions that prohibit certain wasteful water use practices including those that are identified below:

The following conditions are included:

- ◆ All consumers, whether owners or not, shall maintain and keep in good repair the water pipes on the interior and exterior of the property served. Such persons shall not allow faucets or water closets to leak, and such fixtures must not be left running.²
- ◆ Watering of lawns and gardens from an open hose is prohibited. A spray or nozzle must, in all cases, be used.³
- ◆ The city reserves the right to limit irrigation hours in the case of water shortages or emergencies.⁴
- ◆ It is unlawful and an infraction for any person to cause or allow any water received by such person to flow away in unreasonable amounts, from property owned or occupied by such persons, in any gutter, ditch or other manner over the surface of the ground.⁵

¹ Title 13 Public Services, Chapter 4 Water, Article VI Conservation

² City of Lincoln Municipal Code Section 13.04.410

³ City of Lincoln Municipal Code Section 13.04.420

⁴ City of Lincoln Municipal Code Section 13.04.430

⁵ City of Lincoln Municipal Code Section 13.04.440

6.4 Penalties

The Lincoln City Municipal Code contains provisions for penalties to water customers that violate regulations and restrictions set forth in Article IX. – water conservation and penalties of the City of Lincoln’s Municipal Code.

6.5 Reduction Methods

6.5.1 Stage One – Water Awareness

All water consumers are encouraged to be aware of water consumption and use water wisely. These measures are expected to result in up to 10 percent reduction in water use. Water consumption should be limited to a reasonable level necessary to maintain the public health, business operations, and landscaping. The following restrictions apply:

- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ All hoses, when in use, shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation should not occur during precipitation events.
- ◆ Restaurants shall only serve water upon request to restaurant customers.

6.5.2 Stage Two - Water Alert

All water consumers shall comply with the following conservation measures to achieve between 10 and 20 percent reduction in normal water use:

- ◆ Outdoor irrigation of all ornamental turf shall be limited to no more than three days per week. The allowable days for irrigation will be established by the City Council through resolution.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses, when in use, shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation shall not occur during precipitation events.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.

- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All new pools constructed shall have pool covers.

6.5.3 Stage Three, Water Emergency

Water consumers shall comply with the following conservation measures to achieve between 20 and 35 percent reduction in normal water use:

- ◆ Outdoor irrigation of all ornamental turf shall be limited to no more than two days per week. The days of week allowed for irrigation shall be established by City Council through a resolution.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses when in use shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation shall not occur during precipitation events or within 24 hours of a rain event that produced .20 inches of precipitation or more.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.
- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All new pools constructed shall have pool covers.
- ◆ All restaurants that provide table service shall post, in a conspicuous place, a Notice of Drought Conditions, approved by the Director of Public Services, and shall not serve water except upon specific request by the customer.
- ◆ Boats and vehicles shall be washed only at commercial washing facilities equipped with water recycling equipment or by use of a bucket and hose equipped with a self-closing valve that requires operating positive pressure to activate the flow of water.
- ◆ Operators of hotels, motels, and other commercial establishments offering lodgings shall post in each room and at each site, a Notice of Drought Condition, approved by the Director of Public Services.
- ◆ The operation of and introduction of water into ornamental fountains that do not have a circulating system is prohibited.
- ◆ City Council may adopt additional water conservation regulations and restrictions.
- ◆ The planting or seeding of new ornamental turf is prohibited, including new turf planted or seeded to replace existing ornamental.

6.5.4 Stage Four - Water Crisis

Water consumers shall comply with the following conservation measures to achieve reductions between 35 and 50 percent reduction in normal water use:

- ◆ Irrigation of any yard or other landscaped area containing lawn or turf grass areas is prohibited. This prohibition does not apply to trees.
- ◆ The introduction of water into swimming pools and spas is prohibited except to maintain the structural integrity of such facilities.
- ◆ Outdoor irrigation is prohibited between the hours of 8:00 AM and 9:00 PM.
- ◆ All hoses when in use shall be equipped with a positive pressure nozzle, so that water is only dispensed when the nozzle handle is engaged.
- ◆ Outdoor irrigation should not occur during precipitation events.
- ◆ Irrigation in a manner that results in substantial runoff onto hard surfaces, the adjacent property, non-irrigated areas, or outside of the area intended for irrigation is prohibited.
- ◆ All water leaks shall be repaired within five days or sooner if required by the City.
- ◆ Washing or spraying hard surfaces with water is prohibited except for health and safety purposes.
- ◆ Car, vehicle, boat, or equipment washing is prohibited.
- ◆ Restaurants shall only serve water upon request to restaurant customers.
- ◆ All restaurants that provide table service shall post, in a conspicuous place, a Notice of Drought Conditions, approved by the Director of Public Services, and shall not serve water except upon specific request by the customer.
- ◆ Operators of hotels, motels, and other commercial establishments offering lodgings shall post in each room and at each site, a Notice of Drought Condition, approved by the Director of Public Services.
- ◆ The operation of and introduction of water into ornamental fountains is prohibited.
- ◆ The planting or seeding of new ornamental turf is prohibited, including new turf planted or seeded to replace existing ornamental.
- ◆ Such other and further regulations as the City Council may determine after a public hearing.
- ◆ City Council may adopt additional water conservation regulations and restrictions.

6.6 Revenue and Expenditure Impacts

Reduction in revenues from water sales due to temporary water supply shortages may have an impact on the City's ability to provide services. Some of the revenue loss may be offset by reduced costs to purchase treated water from PCWA.

6.7 Measures to Overcome Impacts

Rate increases may be necessary to offset decreased sales revenue, if deemed necessary by the City Council.

6.8 Reduction Measuring Mechanism

Treated surface water and groundwater deliveries are metered as the water flows into the City's distribution system. During various stages of alert, the frequency of measurement can be increased to better characterize demand and compare to reduction goals. This will allow the City to implement additional demand management measures if goals are not being met or relax some restrictions if demand goals are being exceeded.